

5519-2119704



TRILLIUM INC.

Data Validation Report

TDD No: 09-04-01-0011
PAN: 001275.0440.01TA
Site: El Dorado Hills
Laboratory: Lab/Cor, Inc.
Reviewer: Denise A. Shepperd, Trillium, Inc.
Date: May 20, 2005
Revised August 11, 2005

I. Case Summary

SAMPLE INFORMATION:

Asbestos Samples: SRA-R04-100704; SRA-R03-100704; SRA-R05-100704; SRA-R02-100704; NRA-R101-101004; NRA-R01-101004; NRA-R05-101004; NRA-R04-101004; NRA-R03-101004; and NRA-R02-101004

Matrix: 10 Air samples
Analysis: Asbestos by Transmission Electron Microscopy
Collection Dates: October 7 and 10, 2004
Sample Receipt Date: October 14, 2004
Filter Preparation Date: April 8 and 9, 2005
Grid Preparation Date: April 11, 2005
TEM Analysis Dates: April 18 and 19, 2005
Analytical Method: ISO Method 13794

FIELD QC:

Field Trip Blanks (ZB): NFB-L2-1ZB-10050; SFBB-L2-1ZB-10060; NYB-L2-1ZB-10070; JEG-L2-1ZB-10070; SRA-1ZB-1008004
Filter Blanks (FB): SFBA-L2-FB-10050; JEG-L2-FB-101004; NRA-FB-101004
Column Blank (FB): NRA-FB-101005
Equipment Blanks (EB):
Method Blank (MB): 4 glass filter blanks
Field Duplicates (D1): Not Identified

TABLES:

- 1A: Analytical Results with Qualifications
1B: Data Qualifier Definitions for Inorganic Data Review

SAMPLING ISSUES:

No chain of custody documents were provided in the data package. These samples were originally received by the laboratory as sample lot number 041210. Chain of custody documentation that included these samples was provided on 5/4/05 by electronic transfer, at the request of the validator.

VALIDATION PARAMETERS AND COMMENTS:

I. Holding Times, Preservation and Sample Integrity

This parameter is evaluated to ensure that sample custody is documented from collection through analysis, samples are analyzed within the recommended holding time, and that no alteration in sample content has occurred during sample shipment, handling, and storage.

There is no established holding time or storage condition for asbestos samples.

II. Calibration

The analyses of materials of known content ensures that identification and quantitation of analytes will be accurate for all samples. Review of the documentation provided for appropriate calibration determines whether or not the analytical results reported by the laboratory are valid and supported by the data.

The data deliverables for this project were included in multiple data packages in several shipments. Instrument calibration documentation was provided in a separate data package in association with the site sample data packages in this shipment and included camera and screen magnification calibration (performed 4/7/05 to 4/13/05), camera length and constant calibration (performed 4/5/05 to 4/14/05), EDS peak resolution check (performed on 4/7/05), and maintenance logs for both instruments used for analyses, covering the months of March and April of 2005.

A form entitled "Microscope Based Quality Control" for the month of April 2005 was included. This form listed the various instrument calibration parameters, required frequencies, dates performed, and results. According to this form, k-factor calibration was performed most recently on the two microscopes on 1/11/05 and 3/14/05; beam dose was calibrated on 2/9/05 and 3/18/05.

No documentation of grid opening size was provided.

Documentation to support the identification and quantitation in the site samples in these data packages was provided separately with a previous shipment of data packages from the same project, and included the following:

A letter representing documentation of an NVLAP laboratory site assessment conducted on 11/7/03 was included in the data package. The letter, dated 5/10/04, indicated that the laboratory met the on-site assessment requirements.

Results and evaluator notes and tables were included for an NISTIR 5351 analysis of an inter-laboratory QC sample. The laboratory's raw data were compiled and assessed by Batta Labs. Analysts were identified by initials and included two of the analysts' initials documented with this sample set. "DW" and "KM" performed these PE sample analyses, "JH" and "TM" were not represented. According to the assessor's notes, the sample included chrysotile fibers and structures and the laboratory's results were within NVLAP and NISTIR 5351 acceptance limits. No raw data were provided for this QC sample in the original data package. Raw data were provided under separate cover, at the request of the validator.

Results for a New York State Department of Health Environmental Laboratory Approval Program proficiency test, conducted between 9/7/04 and 11/9/04, were also included. The proficiency samples included asbestos in air. The laboratory's results were satisfactory for all four of the air sample categories. Actinolite and amosite fiber types



were identified and counts were acceptable, according to the data sheet. No raw data were provided for this proficiency sample. Upon request, the laboratory provided raw data documenting the identification of actinolite and amosite asbestos on 1/27/05, in conjunction with the validation of a previous shipment of data packages. These data were inserted by the validator into the QC data package provided, as supporting data, with the previous shipment of data packages.

Documentation for a round-robin sample analyzed in the fall of 2004, by three separate laboratories, as part of the NVLAP requirements, was also included in the QC data package. The documentation included raw count sheets and reported results, as well as comparison with other laboratories' results. Results for all parameters were acceptable. According to the documentation, the only analyst who participated in these analyses was "DW."

Based on the fact that the laboratory demonstrated proficiency in the performance evaluation (PE) analyses performed in the third quarter of 2004, and that these PE samples included the two predominant asbestos types detected in this field sample set, no action was taken by the validator.

III. Blanks

Sample matrices known to be devoid of the analytes of interest (method blanks) are prepared and analyzed with each analytical batch. Evaluation of this parameter ensures that contamination introduced during preparation and analyses is not attributed to the field samples.

Other blanks may be generated in the field or laboratory to ensure that no contamination is introduced during sampling and/or storage.

No field-generated blanks were included with this data set.

The laboratory preparation list and log indicated that one laboratory preparation filter blank was prepared and analyzed by the indirect method in association with the entire 70-sample set (041172, 041188, 041191, 141210, and 050680). No raw data were supplied for this blank, but a value of "0" structures detected was present on the QC summary form. According to the prep sheets, this blank was prepared on 1/13/05 (ashed and "hydrolyzed") and 3/16/05 (grid preparation). This blank would be an indicator of any contamination present in the blank filters used for preparation and for any contamination present in the prep lab environment on 1/13/05 and 3/16/05, but it does not address contamination issues for the dates on which the samples in this data set (050680) were prepared.

The indirect method used (ISO 13794), recommends analyzing a filter blank and a beaker blank with each set of samples prepared. In addition, it is recommended that the laboratory include an unused filter for preparation with every microscope slide containing sample filters that is prepared. None of these blanks were documented with this data set. Without blanks it is not possible to assess the presence or absence of laboratory contamination or its impact on the site sample results.

The laboratory had prepared blanks with the preparation and analyses of samples in this data set. At the client's request the laboratory analyzed a percentage of the prepared blanks. Data for these blanks were received by the validator on July 6, 2005. Four filter blanks, five field trip blanks, four glass filter blanks, and one column blank were prepared and analyzed as laboratory blanks. No asbestos structures were detected in any of the blanks.

IV. Spiked Samples



The analytes of interest are added in known concentrations to like-matrix blanks or authentic field samples before preparation. This parameter is evaluated in order to assess the laboratory's ability to preserve and recover the compounds of interest.

The analytical method does not require laboratory spiked sample analyses. It is recommended by the validator that some type of laboratory prepared or purchased spiked analyses be performed with each analytical sample batch.

The project requirements specified that results from the most recent inter-laboratory study would be acceptable as a laboratory control sample (LCS) for these data. This requirement was met by the laboratory and results, reported with previous data submissions for this project, for the inter-laboratory study sample were acceptable for all air sample parameters (see Section I). The data user should note, however, that no reference material was prepared and analyzed by the indirect method (ISO 13794) employed for the preparation and analyses of the site samples. This method is used when filter loading is too high to allow the use of the direct method (ISO 10312) and depends on recovery of material from the air-sampling filter, resuspension in solution, effecting a dilution, and redistribution on a secondary filter which is then prepared as for the direct TEM analysis method. Because there are additional steps involved in the preparation, there are additional error factors introduced. It is recommended that a reference material be prepared and analyzed by the indirect method so that performance can be tracked by the laboratory for support of field sample analyses by this procedure.

V. Duplicate/Replicate Samples

Results for duplicate/replicate samples are evaluated to assess the laboratory's precision for the analytes of interest in the applicable sample matrix. For asbestos analyses, duplicate and replicate measurements take the form of a combination of variables which include the preparation of the grid, the choice of grid openings to be analyzed, and the analyst performing the counting and identification of structures. For the indirect method the variables should also include preparation of the filter itself.

The laboratory included all of the QC samples from all of the field sample sets in this shipment in a separate data package under a separate report number (050580).

Two analysts, JH and TM, not represented in the PE sample analyses included with the data packages for this project, did perform intra-laboratory replicate and duplicate analyses on associated field samples. Results for these QC analyses for these analysts were within the sample-specific acceptance limits stipulated by the method.

The quality assurance project plan (QAPP) requires five types of laboratory duplicate/replicate analyses, each to be performed at a rate of 5% (one for every twenty) of the field samples. Based on the total of samples prepared by the indirect method and included in all of the data packages in this shipment combined (70 samples), four or more of each of these QC sample pairs were required (a total of 20 QC sample pairs).

The laboratory compared the primary asbestos structure count for each of the QC samples prepared and analyzed. Results for all of the duplicate/replicate pair types were evaluated based on 95% confidence limits determined from the original sample count result. Results for all of the reported QC samples were within the laboratory's calculated limits.

None of the samples in this data set (050680) was prepared as a QC pair. The laboratory analyzed a total of 11 QC sample pairs from three of the five associated data sets. A summary of the laboratory QC samples analyzed is as follows:

Replicate analyses:



- Two samples were analyzed as replicates, wherein a different preparation was analyzed by the same analyst;

Duplicate analyses:

- Three samples were analyzed as duplicates, wherein the same grid openings were recounted by a different analyst;
- Three samples were analyzed as duplicates, wherein different grid openings were selected for counting by a different analyst;
- Three samples were analyzed as duplicates, wherein a different analyst counted a different preparation.

No samples were analyzed as replicates, wherein the same analyst re-counts the same sample a second time counting different grid openings.

According to the preparation list and log, two samples (from 041188 and 041191) were re-prepared on 3/29/05 and 3/30/05. The second preparation of these two samples involved ashing the filters for two hours, according to notes on the prep list. It was assumed by the validator that these were the only samples which were carried through all of the filtering and grid preparation steps. Other QC samples listed as repreps were assumed to be additional grid preparations from the same filter only.

Agreement between the results for the 11 sample QC pairs analyzed in conjunction with the combined project-related laboratory batches in four of the required categories were acceptable. In addition, four samples were re-analyzed by the same analyst counting the same grid openings. These results were also acceptable according to the laboratory-specified limits. This category was not included as a requirement in the project QAPP.

The data user is cautioned that although the laboratory QC counts met the specified criteria, the acceptance range includes as much as a three-fold difference in asbestos concentrations for these samples. This range of variability is applicable to all asbestos results in this data set.

According to the QAPP provided with the data packages, field duplicates were required at a rate of 10% of field samples. Field duplicate pairs were not identified or evaluated as part of this validation effort.

VI. Identification

Identification of asbestos structures and fibers is dependent on sample preparation techniques, analyst training, instrument operation, and data interpretation. Comparison with results from known standards is used to evaluate the accuracy of the structure identification for field samples.

Actinolite, chrysotile, and winchite were identified in the field and QC samples. According to the report forms provided in the QC package included with a previous data package shipment for the project, the laboratory correctly identified actinolite, chrysotile, and amosite in PE sample analyses performed in the third quarter of 2004. Comparison of identification between the various analysts, grid opening, and preparations combinations that make up the daily QC for these analyses, included separately with this shipment of data packages, were within acceptance limits. Therefore; based on the documentation provided, fiber and structure identifications for chrysotile and actinolite were determined to be valid as reported. The identification of winchite was supported with EDS confirmation, however, no documentation of a reference material for this mineral was included.

VII. Quantitation and Reported Detection Limits



Raw data documentation is reviewed to ensure that all reported results and detection limits are correctly calculated, accurately reported, and supported by the raw data.

Results for asbestos categories, fiber density, and detection limits were correctly calculated and accurately reported by the laboratory. Results were verified by the validator using the information included on the reporting forms and the chain of custody records.

VIII. System Performance

This parameter is evaluated to ensure that the laboratory analytical systems were functioning properly at the time of analyses and that methodology appropriate to the analyses were followed.

The analytical systems appear to have been working satisfactorily and to have been calibrated properly at the time of these analyses, based on the documentation provided in this data package shipment. Grid opening calibration and spot size calibration were not documented.

IX. Documentation

Data and documentation completeness is critical in providing support for the reported results. Problems encountered with the nature or quality of the data package documentation are addressed.

The volume of air filtered for sample NRA-R01-101004 was recorded on the COC record and the laboratory prep log as 5186.26. The volume listed on the Form I for this sample was 5186.25. This number was corrected by the validator to agree with the raw data. No adjustments to structure concentrations were necessary.

No raw data were provided in the data package for the proficiency samples analyzed in support of the laboratory's accreditation. Raw data to support the identification of actinolite and amosite were received upon request on 1/26/05 in conjunction with validation of a previous shipment of data from the same project.

Raw data for chrysotile fibers identified in only selected field samples from this data set were provided. A listing of fiber verifications was provided and included at least one structure from each of the samples in which chrysotile was identified.

Count sheets included in the data package are computer generated forms. No date of the actual count is presented on these forms. If there is a corresponding bench sheet from which these forms are prepared, these should be supplied as a part of the data package. It is recommended that analyst's initials and date of count be added to the documentation.

The legend for the count sheets, which defines the codes used for the structure counts lists PSCH as the code for protocol chrysotile structures. The code appearing on the count sheets for this category is PCAS.

COMMENTS:

These samples were analyzed by both the direct (ISO 10312) and indirect (ISO 13794) methods in order to provide comparison between the methods. In making the comparison the data user should note that the ten samples chosen had very low counts in the direct method are not appropriate for analysis by the indirect method, which is designed to accommodate the analysis of highly loaded filters. Therefore, criteria for comparison between the paired results should be chosen carefully to avoid the bias inherent in 95% confidence limits at very low concentrations. Samples with much higher structure counts would be a better choice for comparison of these two methods.



- A. The volume of air filtered for sample NRA-R01-101004 was recorded on the COC record and the laboratory prep log as 5186.26. The volume listed on the Form I for this sample was 5186.25. This number was corrected by the validator to agree with the raw data. No adjustments to structure concentrations was necessary.

The laboratory reported results, analytical sensitivity, and detection limits to three significant figures. The data user should be aware that because all of these values are based on the counting of whole asbestos structures, the appropriate number of significant figures will be limited by the structure count. A total count of eight fibers will warrant results with only one significant figure; a count of 12 will warrant two, etc. Because the analytical sensitivity and detection limit are calculated from an assumed single asbestos structure, only one significant figure is accurate for these values, rather than the three reported by the laboratory. A second significant figure, if used, is considered estimated. The validator-calculated results, analytical sensitivities, and detection limits varied from the laboratory values in many cases, however, these discrepancies appeared to be due to rounding. The validator did not adjust the laboratory results to reduce the number of significant figures.

It is recommended that complete instrument calibration documentation be provided with every data package to fully support the site sample results.

The data results tables included as Table 1A include only the primary and total asbestos structure counts. Counts for individual categories required by the project Scope of Work are presented in the associated electronic data deliverables (EDD) tables.

This report was prepared according to the specifications of the analytical method, ISO Method 13794 "Ambient air - Determination of asbestos fibres - Indirect-transfer transmission electron microscopy method," the document "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," 10/99, and Trillium, Inc.'s SOP No. 0497-06A, for Validation of Analytical Data: Inorganic Analytes.

Table 1A
Analytical Results with Qualifications
Asbestos in Air Samples

C-sample-num	Type	# of structures counted	Concentra tions	Analytical Sensitivity (AS)	Units	Lower	Upper	Val Adj Result Conc.	Val Qual	Val Adj AS	Val Units	Val Comm
SRA-R04-100704	Primary Asbestos Structures	7	0.00203	0.000289	structures/ cc	0.000812	0.00416				structures/ cc	
SRA-R04-100704	Total Asbestos Structures	6	0.00174	0.000289	structures/ cc	0.000636	0.00379				structures/ cc	
SRA-R03-100704	Primary Asbestos Structures	4	0.00113	0.000283	structures/ cc	0.000308	0.00289				structures/ cc	
SRA-R03-100704	Total Asbestos Structures	4	0.00113	0.000283	structures/ cc	0.000308	0.00289				structures/ cc	
SRA-R05-100704	Primary Asbestos Structures	4	0.00114	0.000286	structures/ cc	0.000312	0.00292				structures/ cc	
SRA-R05-100704	Total Asbestos Structures	4	0.00114	0.000286	structures/ cc	0.000312	0.00292				structures/ cc	
SRA-R02-100704	Primary Asbestos Structures	8	0.00231	0.000288	structures/ cc	0.000994	0.00455				structures/ cc	
SRA-R02-100704	Total Asbestos Structures	8	0.00231	0.000288	structures/ cc	0.000994	0.00455				structures/ cc	
NRA-R101-101004	Primary Asbestos Structures	0	0	0.000297	structures/ cc	0.000000	0.000888				structures/ cc	
NRA-R101-101004	Total Asbestos Structures	0	0	0.000297	structures/ cc	0.000000	0.000888				structures/ cc	
NRA-R01-101004	Primary Asbestos Structures	6	0.00181	0.000302	structures/ cc	0.000664	0.00396				structures/ cc	A
NRA-R01-101004	Total Asbestos Structures	6	0.00181	0.000302	structures/ cc	0.000664	0.00396				structures/ cc	A
NRA-R05-101004	Primary Asbestos Structures	2	0.000585	0.000293	structures/ cc	0.000000	0.00185				structures/ cc	
NRA-R05-101004	Total Asbestos Structures	2	0.000585	0.000293	structures/ cc	0.000000	0.00185				structures/ cc	
NRA-R04-101004	Primary Asbestos Structures	0	0	0.000301	structures/ cc	0.000000	0.000900				structures/ cc	
NRA-R04-101004	Total Asbestos Structures	0	0	0.000301	structures/ cc	0.000000	0.000900				structures/ cc	

Table 1A
Analytical Results with Qualifications
Asbestos in Air Samples

C-sample-num	Type	# of structures counted	Concentrations	Analytical Sensitivity (AS)	Units	Lower	Upper	Val Adj Result Conc.	Val Qual	Val Adj AS	Val Units	Val Comm
NRA-R03-101004	Primary Asbestos Structures	6	0.00177	0.000295	structures/cc	0.000649	0.00386				structures/cc	
NRA-R03-101004	Total Asbestos Structures	6	0.00177	0.000295	structures/cc	0.000649	0.00386				structures/cc	
NRA-R02-101004	Primary Asbestos Structures	4	0.00117	0.000293	structures/cc	0.000319	0.00299				structures/cc	
NRA-R02-101004	Total Asbestos Structures	4	0.00117	0.000293	structures/cc	0.000319	0.00299				structures/cc	



TABLE 1B

DATA QUALIFIER DEFINITIONS FOR INORGANIC DATA REVIEW

The definitions of the following qualifiers are prepared in accordance with the document, "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," 2/94.

- U** The analyte was analyzed for, but was not detected above the level of the reported value. The reported value is either the sample quantitation limit or the sample detection limit.
- L** Indicates results which fall between the sample detection limit and the CRDL. Results are estimated and are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection.
- J** The associated value is an estimated quantity. The analyte was analyzed for and was positively identified, but the reported numerical value may not be consistent with the amount actually present in the environmental sample.
- R** The data are unusable. The analyte was analyzed for, but the presence or absence of the analyte cannot be verified.
- UJ** A combination of the "U" and "J" qualifier. The analyte was analyzed for but was not detected. The reported value is an estimate and may be inaccurate or imprecise.

Lab/Cor, Inc.

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Friday, April 22, 2005

Lab/Cor Report Number: 050680R01

Howard Edwards
 Ecology and Environment, Inc.
 350 Sansome
 Ste 300
 San Francisco CA 94104

Phone: 415-981-2811
 Fax: 415-981-0801

Project Name: Indirect QC of L/C# 041210
 Project Number: 0440.01CP-0018
 Client Reference:
 Sample Receipt Date: 4/18/2005

Enclosed please find results for samples submitted to our laboratory. A list of samples and analyses follows:

Lab/Cor Analysis #	Client Sample # and Description	Analysis Type and Notes
<i>Batch #: B5418</i>		
S1-A1	SRA-R04-100704 Indirect Analysis of L/C# 041210-18	ISO 13794, indirect
S2-A1	SRA-R03-100704 Indirect Analysis of L/C# 041210-19	ISO 13794, indirect
S3-A1	SRA-R05-100704 Indirect Analysis of L/C# 041210-20	ISO 13794, indirect
S4-A1	SRA-R02-100704 Indirect Analysis of L/C# 041210-21	ISO 13794, indirect
S5-A1	NRA-R101-101004 Indirect Analysis of L/C# 041210-34	ISO 13794, indirect
S6-A1	NRA-R01-101004 Indirect Analysis of L/C# 041210-35	ISO 13794, indirect
S7-A1	NRA-R05-101004 Indirect Analysis of L/C# 041210-36	ISO 13794, indirect
S8-A1	NRA-R04-101004 Indirect Analysis of L/C# 041210-37	ISO 13794, indirect
S9-A1	NRA-R03-101004 Indirect Analysis of L/C# 041210-38	ISO 13794, indirect
S10-A1	NRA-R02-101004 Indirect Analysis of L/C# 041210-39	ISO 13794, indirect

ISO 13794, indirect Preparation and analysis of the above samples was conducted in accordance with the ISO method 13794 (Indirect) for the identification of asbestos. Briefly, a portion of the original filter was ashed and treated with acetic acid to isolate the material of interest. The samples were then aliquoted onto lab filters which were collapsed with acetone, then etched in a low temperature plasma etcher to remove the top surface of the filter and other organics. The samples were carbon coated at high vacuum with a thin layer of carbon, placed on 200 mesh copper grids and allowed to dissolve in acetone until cleared of filter debris.

TEM analysis was performed using a transmission electron microscope equipped with an EDS X ray analyzer. The redeposit samples were analyzed at various approximate screen magnifications of 5,000x for PCM equivalent structures, 10,000x for asbestos

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structures greater than 5.0 micrometer lengths, and 20,000x for asbestos structures greater than 0.5 micrometer lengths. An accelerating voltage of 100 KV was applied. The sizing of grid openings was performed on the microscope at a magnification of approximately 550X.

Disclaimer

This test report relates only to the items tested in this report. Interpretation of these results is the sole responsibility of the client.

If further clarification of these results is needed, please call us. Thank you for allowing the staff at Lab/Cor, Inc. the opportunity to provide you with analytical services.

Sincerely,



John Harris, M.P.H.
Laboratory Director

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S1 A1	Volume (L)	6136.4
Client Sample No.	SRA-R04-100704	No. of Grid Openings	15
Description	Indirect Analysis of L/C# 041210-18	Filter Area (mm²)	193
Analysis Date	4/18/2005	Area Analyzed (mm²)	0.217
Analyst	KM	Analytical Sens. (struc/cc)	0.000289
		Detection Limit. (struc/cc)	0.000865

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	32.2	0.00203	0.000814 - 0.00417	7
Total Asbestos Structures	27.6	0.00174	0.000637 - 0.00378	6
Asbestos Structures > 5um	0.0	<0.000865	0.00 - 0.000865	0
Asbestos Fibers and Bundles > 5um	0.0	<0.000865	0.00 - 0.000865	0
PCM Equivalent Fibers-US	0.0	<0.000865	0.00 - 0.000865	0
PCM Equivalent Structures-US	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL ASB STRUCS >10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000865	0.00 - 0.000865	0
AHERA-like Total Structures 3:1	27.6	0.00174	0.000637 - 0.00378	6
AHERA-like Asb Strucs >5 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
AHERA-like Asb Strucs 5 - 10 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
Total Other Amphibole Strucs 3:1	4.6	0.000289	0.00 - 0.00137	1
Other Amphibole Strucs >5 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000865	0.00 - 0.000865	0

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Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S1 A1	Volume (L)	6136.4
Client Sample No.	SRA-R04-100704	No. of Grid Openings	15
Description	Indirect Analysis of L/C# 041210-18	Filter Area (mm²)	193
Analysis Date	4/18/2005	Area Analyzed (mm²)	0.217
Analyst	KM	Analytical Sens. (struc/cc)	0.000289
		Detection Limit. (struc/cc)	0.000865

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	32.2	0.00203	0.000814 - 0.00417	7
Total Asbestos Structures	27.6	0.00174	0.000637 - 0.00378	6
Asbestos Structures > 5um	0.0	<0.000865	0.00 - 0.000865	0
Asbestos Fibers and Bundles > 5um	0.0	<0.000865	0.00 - 0.000865	0
PCM Equivalent Fibers-US	0.0	<0.000865	0.00 - 0.000865	0
PCM Equivalent Structures-US	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL ASB STRUCS >10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000865	0.00 - 0.000865	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000865	0.00 - 0.000865	0
AHERA-like Total Structures 3:1	27.6	0.00174	0.000637 - 0.00378	6
AHERA-like Asb Strucs >5 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
AHERA-like Asb Strucs 5 - 10 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
Total Other Amphibole Strucs 3:1	4.6	0.000289	0.00 - 0.00137	1
Other Amphibole Strucs >5 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000865	0.00 - 0.000865	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000865	0.00 - 0.000865	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No. B5418 S2 A1

Client Sample No. SRA-R03-100704

Description Indirect Analysis of L/C# 041210-19

Analysis Date 4/18/2005

Analyst KM

Volume (L) 5885.4

No. of Grid Openings 16

Filter Area (mm²) 193

Area Analyzed (mm²) 0.232

Analytical Sens. (struc/cc) 0.000283

Detection Limit. (struc/cc) 0.000846

Structure Type	Filter Density (a/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	17.3	0.00113	0.000308 - 0.00290	4
Total Asbestos Structures	17.3	0.00113	0.000308 - 0.00290	4
Asbestos Structures > 5um	0.0	<0.000846	0.00 - 0.000846	0
Asbestos Fibers and Bundles > 5um	0.0	<0.000846	0.00 - 0.000846	0
PCM Equivalent Fibers-US	0.0	<0.000846	0.00 - 0.000846	0
PCM Equivalent Structures-US	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL ASB STRUCS >10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000846	0.00 - 0.000846	0
AHERA-like Total Structures 3:1	17.3	0.00113	0.000308 - 0.00290	4
AHERA-like Asb Strucs >5 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
AHERA-like Asb Strucs 5 - 10 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
Total Other Amphibole Strucs 3:1	0.0	<0.000846	0.00 - 0.000846	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000846	0.00 - 0.000846	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.
 Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No. B5418 S3 A1

Volume (L) 5817.4

Client Sample No. SRA-R05-100704

No. of Grid Openings 16

Description Indirect Analysis of L/C# 041210-20

Filter Area (mm²) 193

Analysis Date 4/19/2005

Area Analyzed (mm²) 0.232

Analyst KM

Analytical Sens. (struc/cc) 0.000286

Detection Limit. (struc/cc) 0.000856

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	17.3	0.00114	0.000312 - 0.00293	4
Total Asbestos Structures	17.3	0.00114	0.000312 - 0.00293	4
Asbestos Structures > 5um	17.3	0.00114	0.000312 - 0.00293	4
Asbestos Fibers and Bundles > 5um	17.3	0.00114	0.000312 - 0.00293	4
PCM Equivalent Fibers-US	17.3	0.00114	0.000312 - 0.00293	4
PCM-Equivalent Structures-US	12.9	0.000859	0.00 - 0.00222	3
PROTOCOL ASB STRUCS 5-10	4.3	0.000286	0.00 - 0.00136	1
PROTOCOL ASB STRUCS >10	0.0	<0.000856	0.00 - 0.000856	0
PROTOCOL ASB STRUCS TOTAL	4.3	0.000286	0.00 - 0.00136	1
PROTOCOL CHRYS STRUCS 5-10	4.3	0.000286	0.00 - 0.00136	1
PROTOCOL CHRYS STRUCS >10	0.0	<0.000856	0.00 - 0.000856	0
PROTOCOL CHRYS STRUCS TOTAL	4.3	0.000286	0.00 - 0.00136	1
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000856	0.00 - 0.000856	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000856	0.00 - 0.000856	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000856	0.00 - 0.000856	0
AHERA-like Total Structures 3:1	17.3	0.00114	0.000312 - 0.00293	4
AHERA-like Asb Struc >5 and 3:1	17.3	0.00114	0.000312 - 0.00293	4
AHERA-like Asb Strucs 5 - 10 and 3:1	12.9	0.000859	0.00 - 0.00222	3
AHERA-like Asb Strucs >10 and 3:1	4.3	0.000286	0.00 - 0.00136	1
Total Other Amphibole Strucs 3:1	0.0	<0.000856	0.00 - 0.000856	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000856	0.00 - 0.000856	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000856	0.00 - 0.000856	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000856	0.00 - 0.000856	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No. B5418 S4 A1
Client Sample No. SRA-R02-100704
Description Indirect Analysis of L/C# 041210-21
Analysis Date 4/19/2005
Analyst KM

Volume (L) 6603.3
No. of Grid Openings 14
Filter Area (mm²) 193
Area Analyzed (mm²) 0.203
Analytical Sens. (struc/cc) 0.000288
Detection Limit. (struc/cc) 0.000862

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	39.4	0.00231	0.000995 - 0.00454	8
Total Asbestos Structures	39.4	0.00231	0.000995 - 0.00454	8
Asbestos Structures > 5um	9.9	0.000576	0.00 - 0.00182	2
Asbestos Fibers and Bundles > 5um	4.9	0.000288	0.00 - 0.00137	1
PCM Equivalent Fibers-US	4.9	0.000288	0.00 - 0.00137	1
PCM Equivalent Structures-US	4.9	0.000288	0.00 - 0.00137	1
PROTOCOL ASB STRUCS 5-10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL ASB STRUCS >10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000862	0.00 - 0.000862	0
AHERA-like Total Structures 3:1	39.4	0.00231	0.000995 - 0.00454	8
AHERA-like Asb Strucs >5 and 3:1	9.9	0.000576	0.00 - 0.00182	2
AHERA-like Asb Strucs 5 - 10 and 3:1	9.9	0.000576	0.00 - 0.00182	2
AHERA-like Asb Struc >10 and 3:1	0.0	<0.000862	0.00 - 0.000862	0
Total Other Amphibole Strucs 3:1	0.0	<0.000862	0.00 - 0.000862	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000862	0.00 - 0.000862	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000862	0.00 - 0.000862	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000862	0.00 - 0.000862	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S5 A1	Volume (L)	5268.5
Client Sample No.	NRA-R101-101004	No. of Grid Openings	17
Description	Indirect Analysis of L/C# 041210-34	Filter Area (mm ²)	193
Analysis Date	4/19/2005	Area Analyzed (mm ²)	0.246
Analyst	KM	Analytical Sens. (struc/cc)	0.000297
		Detection Limit. (struc/cc)	0.000889

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	0.0	<0.000889	0.00 - 0.000889	0
Total Asbestos Structures	0.0	<0.000889	0.00 - 0.000889	0
Asbestos Structures > 5um	0.0	<0.000889	0.00 - 0.000889	0
Asbestos Fibers and Bundles > 5um	0.0	<0.000889	0.00 - 0.000889	0
PCM Equivalent Fibers-US	0.0	<0.000889	0.00 - 0.000889	0
PCM Equivalent Structures-US	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL ASB STRUCS >10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000889	0.00 - 0.000889	0
AHERA-like Total Structures 3:1	0.0	<0.000889	0.00 - 0.000889	0
AHERA-like Asb Strucs >5 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
AHERA-like Asb Strucs 5 - 10 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
Total Other Amphibole Strucs 3:1	0.0	<0.000889	0.00 - 0.000889	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000889	0.00 - 0.000889	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.
 Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No. B5418 S6 A1
 Client Sample No. NRA-R01-101004
 Description Indirect Analysis of L/C# 041210-35
 Analysis Date 4/18/2005
 Analyst DW

Volume (L) 5186.2⁶ D Shymal 5/15/05
 No. of Grid Openings 17
 Filter Area (mm²) 193
 Area Analyzed (mm²) 0.246
 Analytical Sens. (struc/cc) 0.000302
 Detection Limit. (struc/cc) 0.000903

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence interval (struc/cc)	Struc. Count
Primary Asbestos Structures	24.4	0.00181	0.000665 - 0.00395	6
Total Asbestos Structures	24.4	0.00181	0.000665 - 0.00395	6
Asbestos Structures > 5um	4.1	0.000302	0.00 - 0.00143	1
Asbestos Fibers and Bundles > 5um	4.1	0.000302	0.00 - 0.00143	1
PCM Equivalent Fibers-US	4.1	0.000302	0.00 - 0.00143	1
PCM Equivalent Structures-US	4.1	0.000302	0.00 - 0.00143	1
PROTOCOL ASB STRUCS 5-10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL ASB STRUCS >10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000903	0.00 - 0.000903	0
AHERA-like Total Structures 3:1	24.4	0.00181	0.000665 - 0.00395	6
AHERA-like Asb Strucs >5 and 3:1	4.1	0.000302	0.00 - 0.00143	1
AHERA-like Asb Strucs 5 - 10 and 3:1	4.1	0.000302	0.00 - 0.00143	1
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000903	0.00 - 0.000903	0
Total Other Amphibole Strucs 3:1	0.0	<0.000903	0.00 - 0.000903	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000903	0.00 - 0.000903	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000903	0.00 - 0.000903	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000903	0.00 - 0.000903	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report #: 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.:	B5418 S7 A1	Volume (L)	4791.6
Client Sample No.:	NRA-R05-101004	No. of Grid Openings	19
Description:	Indirect Analysis of L/C# 041210-36	Filter Area (mm²)	193
Analysis Date	4/18/2005	Area Analyzed (mm²)	0.275
Analyst	DW	Analytical Sens. (struc/cc)	0.000293
		Detection Limit. (struc/cc)	0.000875

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	7.3	0.000585	0.00 - 0.00184	2
Total Asbestos Structures	7.3	0.000585	0.00 - 0.00184	2
Asbestos Structures > 5um	7.3	0.000585	0.00 - 0.00184	2
Asbestos Fibers and Bundles > 5um	7.3	0.000585	0.00 - 0.00184	2
PCM Equivalent Fibers-US	7.3	0.000585	0.00 - 0.00184	2
PCM Equivalent Structures-US	7.3	0.000585	0.00 - 0.00184	2
PROTOCOL ASB STRUCS 5-10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL ASB STRUCS >10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000875	0.00 - 0.000875	0
AHERA-like Total Structures 3:1	7.3	0.000585	0.00 - 0.00184	2
AHERA-like Asb Strucs >5 and 3:1	7.3	0.000585	0.00 - 0.00184	2
AHERA-like Asb Strucs 5 - 10 and 3:1	3.6	0.000293	0.00 - 0.00139	1
AHERA-like Asb Strucs >10 and 3:1	3.6	0.000293	0.00 - 0.00139	1
Total Other Amphibole Strucs 3:1	0.0	<0.000875	0.00 - 0.000875	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000875	0.00 - 0.000875	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000875	0.00 - 0.000875	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000875	0.00 - 0.000875	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No. B5418 S8 A1

Volume (L) 4919.34

Client Sample No. NRA-R04-101004

No. of Grid Openings 18

Description Indirect Analysis of L/C# 041210-37

Filter Area (mm²) 193

Analysis Date 4/18/2005

Area Analyzed (mm²) 0.261

Analyst DW

Analytical Sens. (struc/cc) 0.000301

Detection Limit. (struc/cc) 0.000900

Structure Type	Filter Density (s/mm²)	Concen- tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	0.0	<0.000900	0.00 - 0.000900	0
Total Asbestos Structures	0.0	<0.000900	0.00 - 0.000900	0
Asbestos Structures > 5um	0.0	<0.000900	0.00 - 0.000900	0
Asbestos Fibers and Bundles > 5um	0.0	<0.000900	0.00 - 0.000900	0
PCM Equivalent Fibers-US	0.0	<0.000900	0.00 - 0.000900	0
PCM Equivalent Structures-US	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL ASB STRUCS >10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000900	0.00 - 0.000900	0
AHERA-like Total Structures 3:1	0.0	<0.000900	0.00 - 0.000900	0
AHERA-like Asb Strucs >5 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
AHERA-like Asb Strucs 5 - 10 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
Total Other Amphibole Strucs 3:1	0.0	<0.000900	0.00 - 0.000900	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000900	0.00 - 0.000900	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210.

ANALYSIS DETAIL

Lab/Cor Sample No. B5418 S9 A1

Client Sample No. NRA-R03-101004

Description Indirect Analysis of L/C# 041210-38

Analysis Date 4/18/2005

Analyst DW

Volume (L) 5024.93

No. of Grid Openings 18

Filter Area (mm²) 193

Area Analyzed (mm²) 0.261

Analytical Sens. (struc/cc) 0.000295

Detection Limit. (struc/cc) 0.000881

Structure Type	Filter Density (s/mm ²)	Concen- tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	23.0	0.00177	0.000649 - 0.00385	6
Total Asbestos Structures	23.0	0.00177	0.000649 - 0.00385	6
Asbestos Structures > 5um	7.7	0.000589	0.00 - 0.00186	2
Asbestos Fibers and Bundles > 5um	0.0	<0.000881	0.00 - 0.000881	0
PCM Equivalent Fibers-US	0.0	<0.000881	0.00 - 0.000881	0
PCM Equivalent Structures-US	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL ASB STRUCS >10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL CHRYS. STRUCS 5-10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL CHRYS. STRUCS >10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL CHRYS. STRUCS TOTAL	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000881	0.00 - 0.000881	0
AHERA-like Total Structures 3:1	23.0	0.00177	0.000649 - 0.00385	6
AHERA-like Asb Strucs >5 and 3:1	7.7	0.000589	0.00 - 0.00186	2
AHERA-like Asb Strucs 5 - 10 and 3:1	3.8	0.000295	0.00 - 0.00140	1
AHERA-like Asb Strucs >10 and 3:1	3.8	0.000295	0.00 - 0.00140	1
Total Other Amphibole Strucs 3:1	0.0	<0.000881	0.00 - 0.000881	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000881	0.00 - 0.000881	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000881	0.00 - 0.000881	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000881	0.00 - 0.000881	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S10 A1	Volume (L)	5049
Client Sample No.	NRA-R02-101004	No. of Grid Openings	18
Description	Indirect Analysis of L/C# 041210-39	Filter Area (mm ²)	193
Analysis Date	4/18/2005	Area Analyzed (mm ²)	0.261
Analyst	DW	Analytical Sens. (struc/cc)	0.000293
		Detection Limit. (struc/cc)	0.000876

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	15.3	0.00117	0.000319 - 0.00300	4
Total Asbestos Structures	15.3	0.00117	0.000319 - 0.00300	4
Asbestos Structures > 5um	7.7	0.000586	0.00 - 0.00185	2
Asbestos Fibers and Bundles > 5um	0.0	<0.000876	0.00 - 0.000876	0
PCM Equivalent Fibers-US	0.0	<0.000876	0.00 - 0.000876	0
PCM Equivalent Structures-US	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL ASB STRUCS >10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000876	0.00 - 0.000876	0
AHERA-like Total Structures 3:1	15.3	0.00117	0.000319 - 0.00300	4
AHERA-like Asb Strucs >5 and 3:1	7.7	0.000586	0.00 - 0.00185	2
AHERA-like Asb Strucs 5 - 10 and 3:1	7.7	0.000586	0.00 - 0.00185	2
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000876	0.00 - 0.000876	0
Total Other Amphibole Strucs 3:1	0.0	<0.000876	0.00 - 0.000876	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000876	0.00 - 0.000876	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000876	0.00 - 0.000876	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000876	0.00 - 0.000876	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: SRA-R04-100704

Lab/Cor Sample No.: B5418 S1 A1

Description: Indirect Analysis of L/C# 041210-18

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wld	Asp	Neg#	EDS#	Comment	Count Categories
A	1	B43	CMQ	1	1	F	1.5	0.11	14			Mg, Si Chrysotile	TAS_AHRA
A	2	B3			NSD								
A	3	C21			NSD								
A	4	D1	CDQ	2	2	F	1.2	0.08	15	1599	1230	Mg, Si Chrysotile Verified - KM	TAS_AHRA
A	5	D41			NSD								
A	6	A43	AZQ	3	3	F	1.7	0.5	3.4	1600	1231	Mg, Al, Si, Ca, Fe Actinolite Zone Axis [5 1 4] - KM	TAS_AHRA
A	7	A23	AQ	4	4	F	4	0.55	7.3			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	7	A23	CD	5	5	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
B	8	B13	OZQ	6	6	F	2.5	0.65	3.8	1601	1232	Na, Mg, Al, Si, Ca, Fe Winchite Zone Axis [1 0 1] - KM	TOS_AHRA
B	9	C3	CD	7	7	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
B	10	C23			NSD								
B	11	A11			NSD								
B	12	D1			NSD								
B	13	A13			NSD								
B	14	D3			NSD								
B	15	D23			NSD								

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

050680 El Dorado

INDIRECT PREP LIST

Reprep of samples: 041210

Prepped	Client ID #	L/C Job #	L/C Original Job #	Sample Vol. (L)	FF Remain	FF Used	Visual Loading	Number of Grid Openings	Aliquot (ml)	Dilution
MH 4/11/2005	SRA-R04-100704	050680-01	041210-18	6136.4	0.89	0.5	1.1	15 ✓	20	1:1
MH 4/11/2005	SRA-R03-100704	050680-02	041210-19	5885.4	0.89	0.5	1.1	16 ✓	20	1:1
MH 4/11/2005	SRA-R05-100704	050680-03	041210-20	5817.4	0.89	0.5	1.1	16 ✓	20	1:1
MH 4/11/2005	SRA-R02-100704	050680-04	041210-21	6603.3	0.89	0.5	1.1	14 ✓	20	1:1
MH 4/11/2005	NRA-R101-101004	050680-05	041210-34	5268.5	0.89	0.5	1.1	17 ✓	20	1:1
MH 4/11/2005	NRA-R01-101004	050680-06	041210-35	5186.26	0.89	0.5	1.1	17 ✓	20	1:1
MH 4/11/2005	NRA-R05-101004	050680-07	041210-36	4791.6	0.89	0.5	1.1	19 ✓	20	1:1
MH 4/11/2005	NRA-R04-101004	050680-08	041210-37	4919.34	0.89	0.5	1.1	18 ✓	20	1:1
MH 4/11/2005	NRA-R03-101004	050680-09	041210-38	5024.93	0.89	0.5	1.1	18 ✓	20	1:1
MH 4/11/2005	NRA-R02-101004	050680-10	041210-39	5049	0.89	0.5	1.1	18 ✓	20	1:1

QC Supervisor,

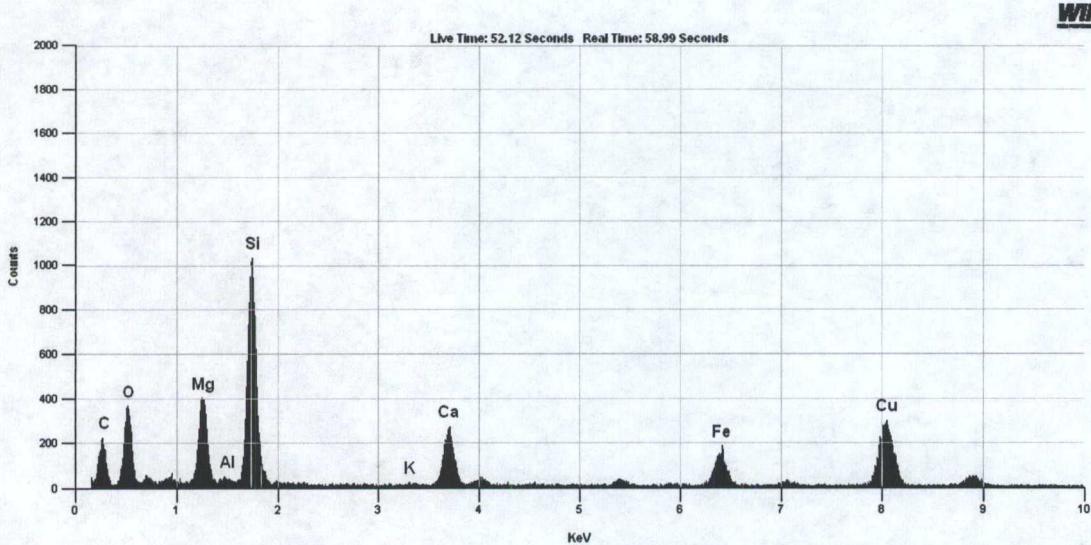
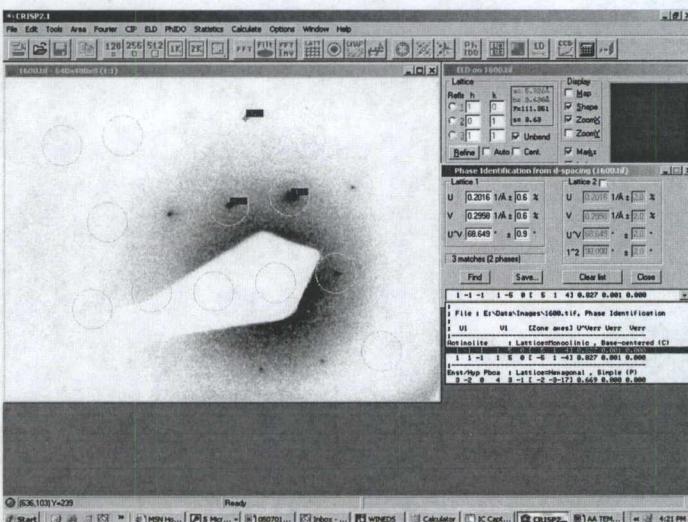
QC Technician,

Kate March

Minh Huynh

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

ACTINOLITE - Zone Axis [5 1 4]
 Neg# J1600 Job# 050680-01
 JEOL 1200EX - Gatan Image



WINEDS

Title: 050680-01 SP 1231 Time: 4:07:04 PM Date: Mon, Apr 18 2005 Accelerating Voltage: 100 KV Take Off Angle: 35 Degrees

Quantitative Analysis Results - Standardless Analysis :

050680-01 SP 1231 Mon, Apr 18 2005

EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 167.80

Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	9.47	MgO	17.51	0.59	17.51
Si	21.07	SiO ₂	58.07	1.28	58.07
K	0.08	K ₂ O	0.18	0.16	0.18
Ca	4.89	CaO	12.58	0.66	12.58
Fe	3.18	Fe ₂ O ₃	11.66	0.89	11.66
<Total> 100.00			100.00		100.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	58.07	Si+4	8.0000	8.0000							
Al2O3	0	Al+3	0.0000	0.0000	0.0000						
TiO2	0	Ti+4	0.0000	0.0000	0.0000						
Cr2O3	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	11.66	Fe+3	0.0893			0.0893	0.0000				
MgO	17.51	Mg+2	3.6369			3.6369	0.0000				
MnO	0	Fe+2	1.2667			1.2667	0.0000				
CaO	12.58	Mn+2	0.0000			0.0000	0.0000				
Na2O	0	Ca+2	1.8809				1.8809	0.0000			
K2O	0.18	Na+	0.0000				0.0000	0.0000	0.0000	0.0000	
		K+	0.0388						0.0388	0.0000	
Total	100		Excess	T site	0.0000	C site	0.0000	B site	0	A site	0

Prefix	none	Total	8	4.9929	1.8809	0.0388	0.0000
Name	actinolite	%Fill	100	99.8577	94.0474		

Modifier

Group

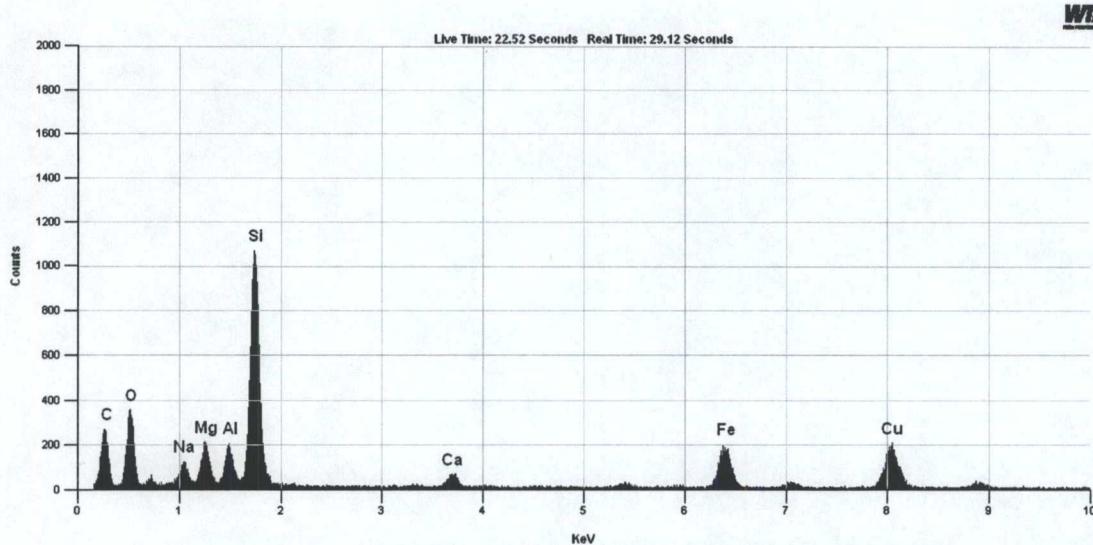
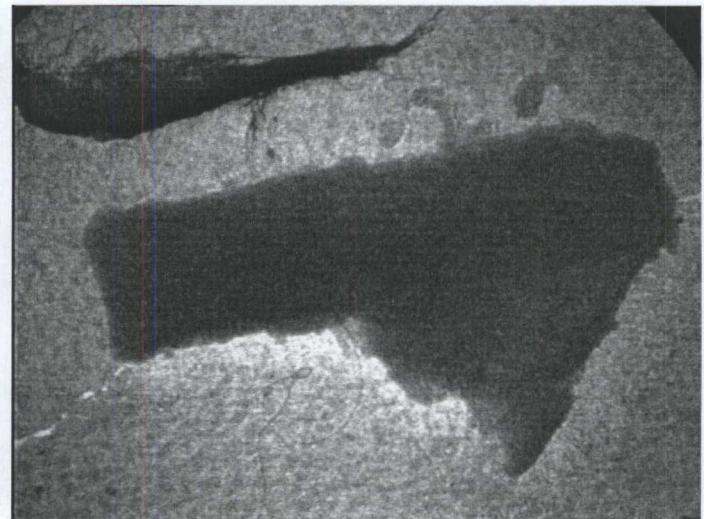
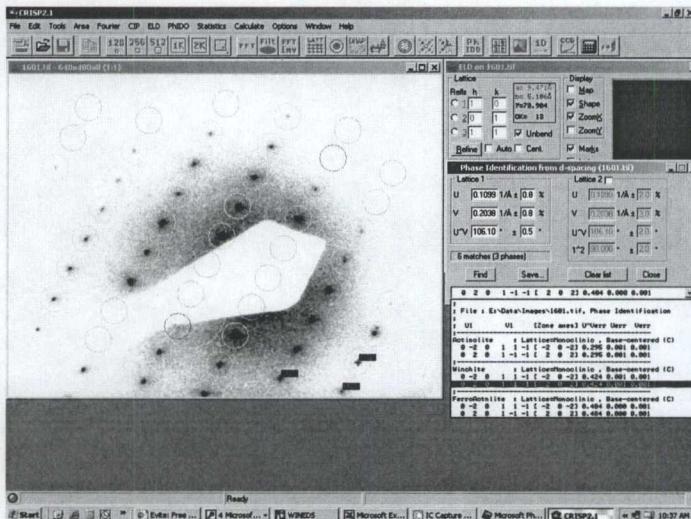
Calcic Amphibole

Sample # 050680-01-1231

<u>Values</u>	<u>Satisfied Conditions</u>
(Ca,Na)@B	1.88 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.88 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.04 Si > 7.5
Mg/(Mg+Fe2)	0.74 (Mg/(Mg+Fe2))< 0.9
Si	8.00

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

WINCHITE - Zone Axis [1 0 1]
 Neg# J1601 Job# 050680-01
 JEOL 1200EX - Gatan Image



Quantitative Analysis Results - Standardless Analysis :
050680-01 SP 1232 Tue, Apr 19 2005
 EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 183.23
 Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Na	2.57	Na2O	3.71	0.42	3.71
Mg	4.38	MgO	8.23	0.49	8.23
Al	1.76	Al2O3	4.17	0.31	4.17
Si	23.50	SiO2	65.75	1.50	65.75
Ca	1.19	CaO	3.12	0.39	3.12
Fe	4.04	Fe2O3	15.02	1.05	15.02
<Total> 100.00			100.00		100.00

	Wt Percent		Ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	65.75	Si+4	8.0000	8.0000							
Al ₂ O ₃	4.17	Al+3	0.7467	0.0000	0.7467						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	15.02	Fe+3	0.0692			0.0692	0.0000				
MgO	8.23	Mg+2	1.8670			1.8670	0.0000				
MnO	0	Fe+2	1.7954			1.7954	0.0000				
CaO	3.12	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	3.71	Ca+2	0.6040					0.6040	0.0000		
K ₂ O	0	Na+	1.1776					1.1776	0.0000	0.0000	0.0000
		K+	0.0000						0.0000	0.0000	
Total	100		Excess	T site	0.7467	C site	0.0000	B site	0	A site	0

Total	8	4.4782	1.7816	0.0000	0.0000
%Fill	100	89.5641	89.0793		

Prefix none

Name winchite

Modifier none

Group Sodic-Calcic Amphibole

Sample # 000000-00-00-00

<u>Values</u>	<u>Satisfied Conditions</u>
(Ca,Na)@B	1.78 (Ca,Na)@B >= 1 and 0.5 <= Na@B < 1.5
Na@B	1.18 (Na,K)@A < 0.5
Na,K)@A	0.00 (Mg/(Mg+Fe2))>= 0.5
Mg/(Mg+Fe2)	0.51 Si > 7.5
Si	8.00

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S2 A1	Volume (L)	5885.4
Client Sample No.	SRA-R03-100704	No. of Grid Openings	16
Description	Indirect Analysis of L/C# 041210-19	Filter Area (mm²)	193
Analysis Date	4/18/2005	Area Analyzed (mm²)	0.232
Analyst	KM	Analytical Sens. (struc/cc)	0.000283
		Detection Limit. (struc/cc)	0.000846

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	17.3	0.00113	0.000308 - 0.00290	4
Total Asbestos Structures	17.3	0.00113	0.000308 - 0.00290	4
Asbestos Structures > 5um	0.0	<0.000846	0.00 - 0.000846	0
Asbestos Fibers and Bundles > 5um	0.0	<0.000846	0.00 - 0.000846	0
PCM Equivalent Fibers-US	0.0	<0.000846	0.00 - 0.000846	0
PCM Equivalent Structures-US	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL ASB STRUCS >10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000846	0.00 - 0.000846	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000846	0.00 - 0.000846	0
AHERA-like Total Structures 3:1	17.3	0.00113	0.000308 - 0.00290	4
AHERA-like Asb Strucs >5 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
AHERA-like Asb Strucs 5 - 10 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
Total Other Amphibole Strucs 3:1	0.0	<0.000846	0.00 - 0.000846	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000846	0.00 - 0.000846	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000846	0.00 - 0.000846	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: SRA-R03-100704

Lab/Cor Sample No.: B5418 S2 A1

Description: Indirect Analysis of L/C# 041210-19

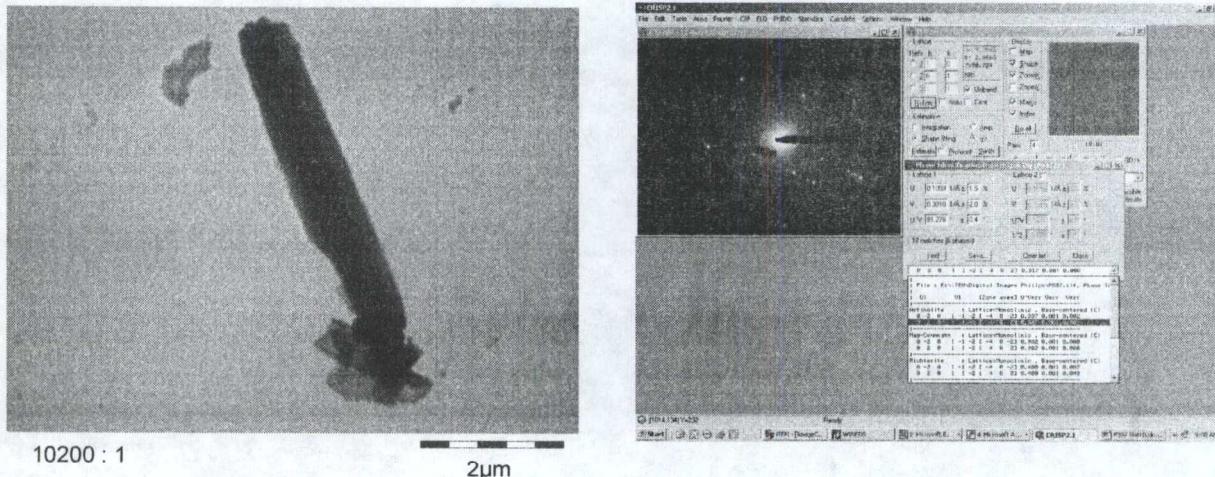
Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	B22				NSD							
A	2	B2				NSD							
A	3	C12	CDQ	1	1	F	0.6	0.1	6.0	1602	1233	Mg, Si Chrysotile Verified- KM TAS_AHRA	
A	4	C32				NSD							
A	5	A32				NSD							
A	6	A12				NSD							
A	7	D2	AQ	2	2	F	2.5	0.78	3.2		1234	Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	8	D22				NSD							
B	9	B32				NSD							
B	10	B12	CD	3	3	F	1.5	0.12	12			Chrysotile	TAS_AHRA
B	11	C12				NSD							
B	12	C32	AZQ	4	4	F	4.8	0.65	7.4	337	16053	Mg, Al, Si, Ca, Fe Actinolite Zone Axis [2 0 1] DW	TAS_AHRA
B	13	A11				NSD							
B	14	D1				NSD							
B	15	D21				NSD							
B	16	D41				NSD							

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

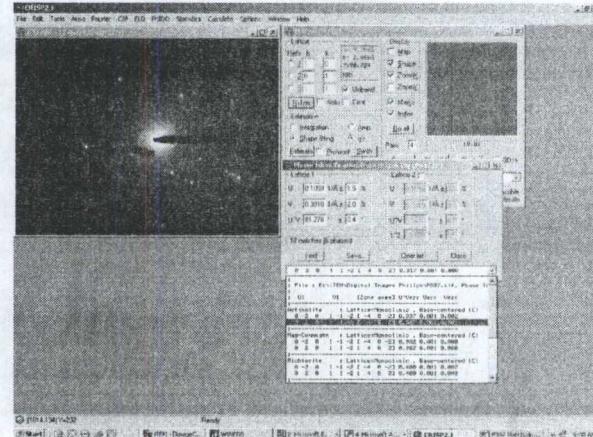
ACTINOLITE

Neg# [337]; [Job#050680-02]
[4/20/05] iITEM Image
Zone Axis [2 0 1]

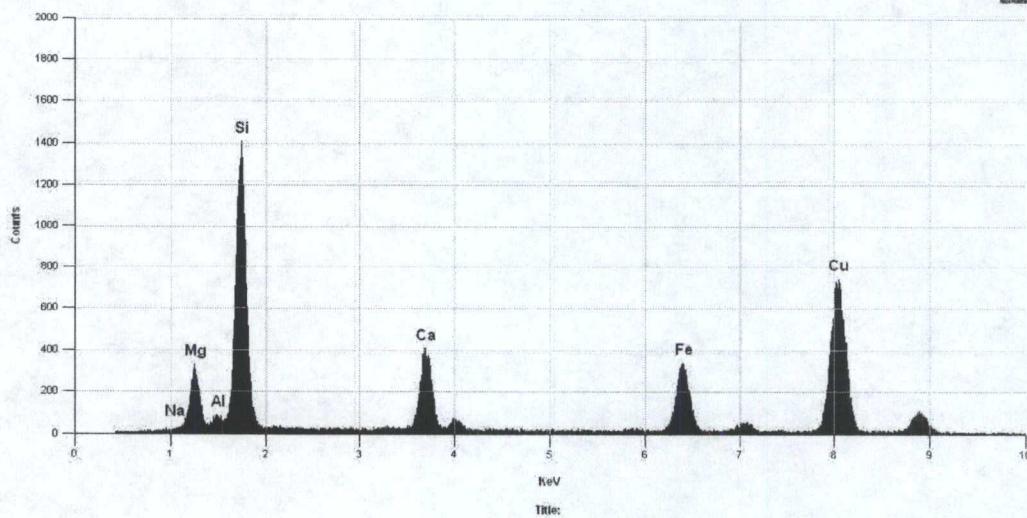


10200 : 1

2μm



WINEDS



Quantitative Analysis Results - Standardless Analysis :
050680-02 EDS#16053 Wed, Apr 20 2005
EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 7.23

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	8.27	MgO	15.21	0.70	15.21
Al	0.29	Al2O3	0.67	0.17	0.67
Si	21.43	SiO2	58.74	1.34	58.74
Ca	4.14	CaO	10.58	0.53	10.58
Fe	4.06	Fe2O3	14.79	0.89	14.79
<Total>	100.00		100.00		100.00

7619 6th Avenue NW, Seattle, WA 98117

www.labcor.net Phone: (206) 781-0155 (Office) Fax: (206) 789-8424 E-mail: mail@labcor.net

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	58.74	Si+4	8.0000	8.0000							
Al ₂ O ₃	0.67	Al+3	0.1230	0.0000	0.1230						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	14.79	Fe+3	0.5010			0.5010	0.0000				
MgO	15.21	Mg+2	3.1689			3.1689	0.0000				
MnO	0	Fe+2	1.1819			1.1819	0.0000				
CaO	10.58	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	0	Ca+2	1.5917					1.5917	0.0000		
K ₂ O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000						0.0000	0.0000	
Total	99.99		Excess	T site	0.1230	C site	0.0000	B site	0	A site	0

Prefix	none	Total	8	4.9748	1.5917	0.0000	0.0000
Name	actinolite	%Fill	100	99.4965	79.5846		

Modifier none

Group Calcic Amphibole

Sample # 050680-02

<u>Values</u>	<u>Satisfied Conditions</u>
(Ca,Na)@B	1.59 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.59 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.73 (Mg/(Mg+Fe2))< 0.9
Si	8.00

Lab/Cor, Inc.

A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S3 A1	Volume (L)	5817.4
Client Sample No.	SRA-R05-100704	No. of Grid Openings	16
Description	Indirect Analysis of L/C# 041210-20	Filter Area (mm²)	193
Analysis Date	4/19/2005	Area Analyzed (mm²)	0.232
Analyst	KM	Analytical Sens. (struc/cc)	0.000286
		Detection Limit. (struc/cc)	0.000856

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	17.3	0.00114	0.000312 - 0.00293	4
Total Asbestos Structures	17.3	0.00114	0.000312 - 0.00293	4
Asbestos Structures > 5um	17.3	0.00114	0.000312 - 0.00293	4
Asbestos Fibers and Bundles > 5um	17.3	0.00114	0.000312 - 0.00293	4
PCM Equivalent Fibers-US	17.3	0.00114	0.000312 - 0.00293	4
PCM Equivalent Structures-US	12.9	0.000859	0.00 - 0.00222	3
PROTOCOL ASB STRUCS 5-10	4.3	0.000286	0.00 - 0.00136	1
PROTOCOL ASB STRUCS >10	0.0	<0.000856	0.00 - 0.000856	0
PROTOCOL ASB STRUCS TOTAL	4.3	0.000286	0.00 - 0.00136	1
PROTOCOL CHRYS STRUCS 5-10	4.3	0.000286	0.00 - 0.00136	1
PROTOCOL CHRYS STRUCS >10	0.0	<0.000856	0.00 - 0.000856	0
PROTOCOL CHRYS STRUCS TOTAL	4.3	0.000286	0.00 - 0.00136	1
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000856	0.00 - 0.000856	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000856	0.00 - 0.000856	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000856	0.00 - 0.000856	0
AHERA-like Total Structures 3:1	17.3	0.00114	0.000312 - 0.00293	4
AHERA-like Asb Strucs >5 and 3:1	17.3	0.00114	0.000312 - 0.00293	4
AHERA-like Asb Strucs 5 - 10 and 3:1	12.9	0.000859	0.00 - 0.00222	3
AHERA-like Asb Strucs >10 and 3:1	4.3	0.000286	0.00 - 0.00136	1
Total Other Amphibole Strucs 3:1	0.0	<0.000856	0.00 - 0.000856	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000856	0.00 - 0.000856	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000856	0.00 - 0.000856	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000856	0.00 - 0.000856	0

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Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: SRA-R05-100704

Lab/Cor Sample No.: B5418 S3 A1

Descripiton: Indirect Analysis of L/C# 041210-20

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	A34			NSD								
A	2	A14			NSD								
A	3	D4			NSD								
A	4	D24	AQ	1	1	F	9	1	9.0		1236	Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	5	D44			NSD								
A	6	D10			NSD								
A	7	D30	AZQ	2	2	F	13	2.5	5.2	333	16050	Mg, Al, Si, Ca, Fe Actinolite Zone Axis [1 0 0] DW	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS10_AHRA
A	8	C33	CDQ	3		MD1-1	10	5	2.0			Chrysotile	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	8	C33	CDQ		3	MB	6.3	0.35	18	334	16051	Mg, Si Chrysotile Verified - KM	AFB>5, PCMEF-US, PSAS 5-10, PSAS TOT, PCAS 5-10, PCAS TOT
B	9	A31			NSD								
B	10	A11			NSD								
B	11	D1			NSD								
B	12	D21	AQ	4	4	F	8.5	1.8	4.7			Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	13	A43			NSD								
B	14	A23			NSD								
B	15	A3			NSD								
B	16	D13			NSD								

Lab/Cor, Inc.

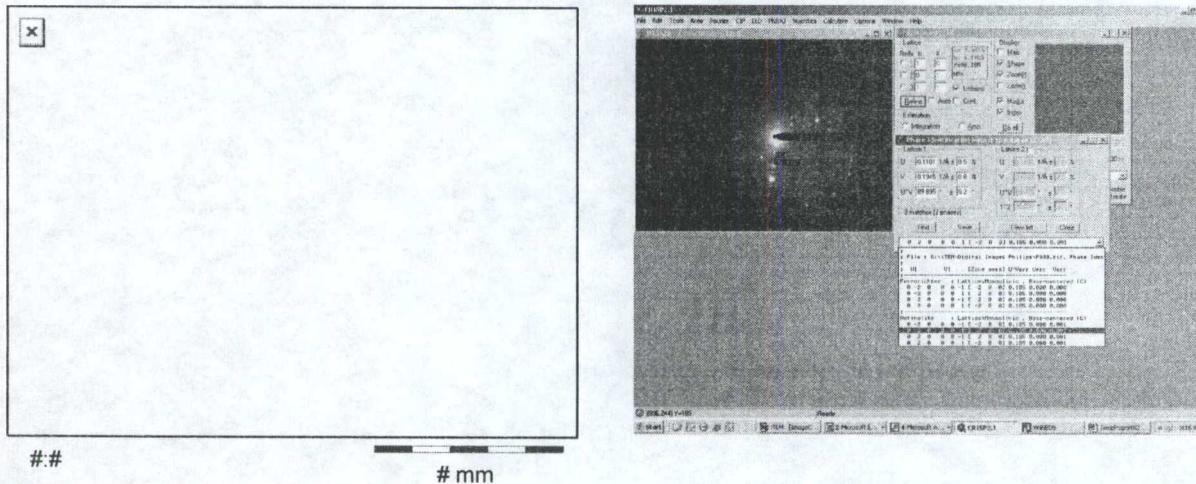
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ACTINOLITE

Neg#[333]; [Job#050680-03]

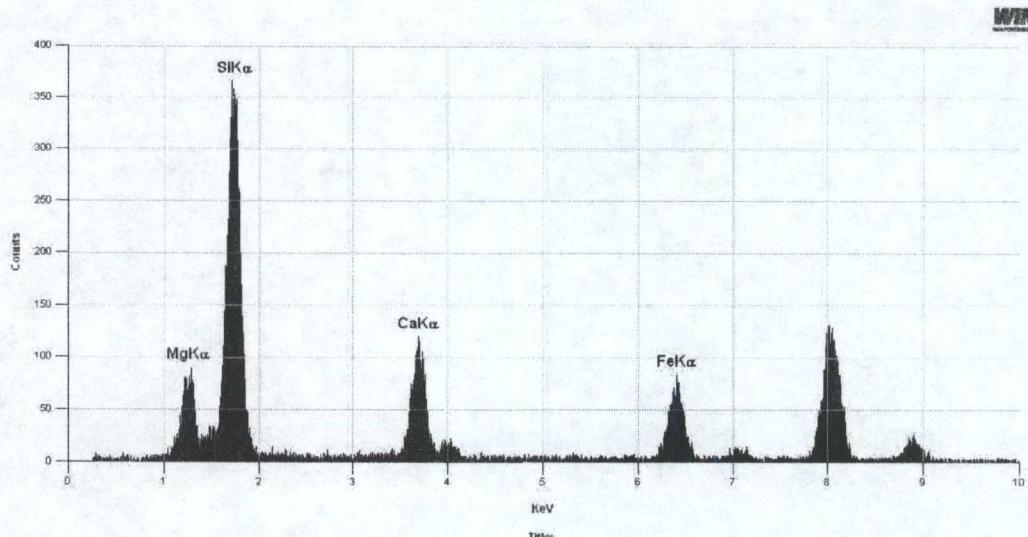
[4/20/05] iITEM Image

Zone Axis [1 0 0]



#:#

mm



Quantitative Analysis Results - Standardless Analysis :
050680-03 EDS#16050 EDS Spectrum Tue, Apr 19 2005
EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 37.79

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	8.50	MgO	15.68	1.78	15.68
Si	21.65	SiO ₂	59.54	3.11	59.54
Ca	4.57	CaO	11.74	1.11	11.74
Fe	3.57	Fe ₂ O ₃	13.04	1.64	13.04
<Total>	100.00		100.00		100.00

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	Wt Percent	ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO2	59.54	Si+4	8.0000	8.0000						
Al2O3	0	Al+3	0.0000	0.0000	0.0000					
TiO2	0	Ti+4	0.0000	0.0000	0.0000					
Cr2O3	0	Cr+3	0.0000		0.0000	0.0000				
Fe(total)O	13.04	Fe+3	0.0640		0.0640	0.0000				
MgO	15.68	Mg+2	3.3299		3.3299	0.0000				
MnO	0	Fe+2	1.5166		1.5166	0.0000				
CaO	11.74	Mn+2	0.0000		0.0000	0.0000				
Na2O	0	Ca+2	1.8082			1.8082	0.0000			
K2O	0	Na+	0.0000			0.0000	0.0000	0.0000	0.0000	
		K+	0.0000					0.0000	0.0000	
Total	100	Excess	T site	0.0000	C site	0.0000	B site	0	A site	0

Total	8	4.9105	1.8082	0.0000	0.0000
%Fill	100	98.21	90.4123		

Prefix none

Name actinolite

Modifier none

Group Calcic Amphibole

Sample # 050680-03

Values	Satisfied Conditions
(Ca,Na)@B	1.81 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.81 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.69 (Mg/(Mg+Fe2))< 0.9
Si	8.00

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Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S4 A1	Volume (L)	6603.3
Client Sample No.	SRA-R02-100704	No. of Grid Openings	14
Description	Indirect Analysis of L/C# 041210-21	Filter Area (mm²)	193
Analysis Date	4/19/2005	Area Analyzed (mm²)	0.203
Analyst	KM	Analytical Sens. (struc/cc)	0.000288
		Detection Limit. (struc/cc)	0.000862

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	39.4	0.00231	0.000995 - 0.00454	8
Total Asbestos Structures	39.4	0.00231	0.000995 - 0.00454	8
Asbestos Structures > 5um	9.9	0.000576	0.00 - 0.00182	2
Asbestos Fibers and Bundles > 5um	4.9	0.000288	0.00 - 0.00137	1
PCM Equivalent Fibers-US	4.9	0.000288	0.00 - 0.00137	1
PCM Equivalent Structures-US	4.9	0.000288	0.00 - 0.00137	1
PROTOCOL ASB STRUCS 5-10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL ASB STRUCS >10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000862	0.00 - 0.000862	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000862	0.00 - 0.000862	0
AHERA-like Total Structures 3:1	39.4	0.00231	0.000995 - 0.00454	8
AHERA-like Asb Strucs >5 and 3:1	9.9	0.000576	0.00 - 0.00182	2
AHERA-like Asb Strucs 5 - 10 and 3:1	9.9	0.000576	0.00 - 0.00182	2
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000862	0.00 - 0.000862	0
Total Other Amphibole Strucs 3:1	0.0	<0.000862	0.00 - 0.000862	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000862	0.00 - 0.000862	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000862	0.00 - 0.000862	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000862	0.00 - 0.000862	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: SRA-R02-100704

Lab/Cor Sample No.: B5418 S4 A1

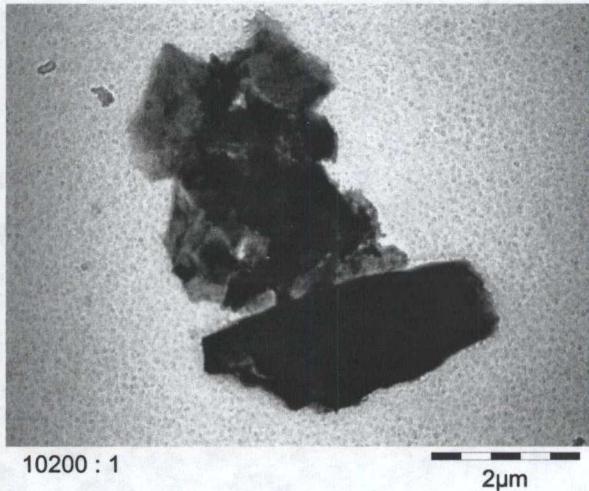
Descripton: Indirect Analysis of L/C# 041210-21

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wld	Asp	Neg#	EDS#	Comment	Count Categories
A	1	A42	CDQ	1	1	F	1.2	0.1	12	354	16068	Mg, Si Chrysotile Verified - KM	TAS_AHRA
A	2	A12			NSD								
A	3	D22	CD	2	2	F	0.5	0.03	17			Chrysotile	TAS_AHRA
A	4	B32			NSD								
A	5	B12			NSD								
A	6	B2	CD	3	3	B	1.1	0.15	7.3			Chrysotile	TAS_AHRA
A	7	C12	AQ	4	4	F	7	1.6	4.4		16069	Mg, Al, Si, Ca, Fe Actinolite	AS>5, AFB-5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	8	A22	AZQ	5		MD1-0	5.5	3.5	1.6			Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	8	A22	AZQ		5	MF	4	1.2	3.3	355	16070	Mg, Al, Si, Ca, Fe Actinolite Zone Axis [3 1 3] - KM	
B	8	A22	AQ	6		MD1-0	1.8	0.8	2.2			Actinolite	TAS_AHRA
B	8	A22	AQ		6	MF	1.5	0.3	5.0			Mg, Al, Si, Ca, Fe Actinolite	
B	9	A2	CD	7	7	F	0.8	0.1	8.0			Chrysotile	TAS_AHRA
B	10	D12			NSD								
B	11	B32			NSD								
B	12	B12			NSD								
B	13	C2			NSD								
B	14	C22	AQ	8	8	F	4.8	1	4.8			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA

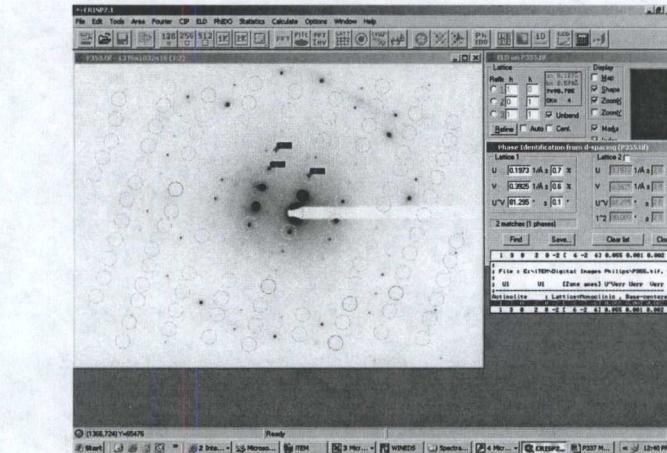
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ACTINOLITE

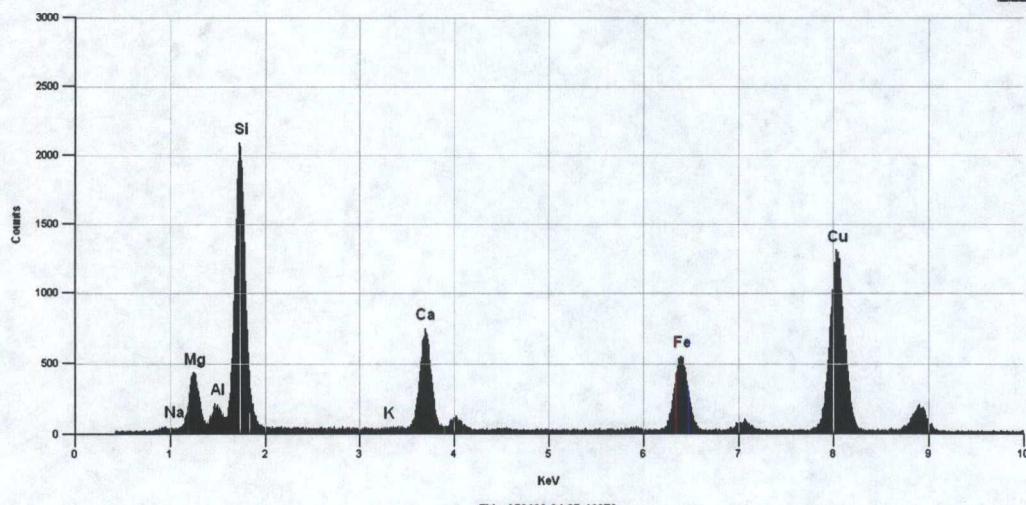
Neg# [355] ; [Job#050680-04]
 [4/22/05] iTEM Image
 Zone Axis [3 1 3]



10200 : 1



WINEDS



Quantitative Analysis Results - Standardless Analysis :
050680-04 SP 16070 Fri, Apr 22 2005
 EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 3.94
 Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	7.65	MgO	13.94	0.56	13.94
Al	0.65	Al ₂ O ₃	1.51	0.16	1.51
Si	20.87	SiO ₂	56.71	1.08	56.71
Ca	4.81	CaO	12.19	0.46	12.19
Fe	4.34	Fe ₂ O ₃	15.66	0.76	15.66
<Total> 100.00			100.00		100.00

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	Wt Percent		Ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	56.71	Si+4	7.9940	7.9940							
Al ₂ O ₃	1.51	Al+3	0.2508	0.0060	0.2449						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	15.66	Fe+3	0.0498			0.0498	0.0000				
MgO	13.94	Mg+2	2.9295			2.9295	0.0000				
MnO	0	Fe+2	1.7905			1.7758	0.0147				
CaO	12.19	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	0	Ca+2	1.8409				1.8409	0.0000			
K ₂ O	0	Na+	0.0000				0.0000	0.0000	0.0000	0.0000	
		K+	0.0000						0.0000	0.0000	
Total	100.01		Excess	T site	0.2449	C site	0.0147	B site	0	A site	0

Prefix	none	Total	8	5.0000	1.8409	0.0000	0.0000
Name	actinolite	%Fill	100	100	92.0454		

Modifier none
 Group Calcic Amphibole

Sample # 050680-04-16070

<u>Values</u>	<u>Satisfied Conditions</u>
(Ca,Na)@B	1.84 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.84 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.62 (Mg/(Mg+Fe2))< 0.9
Si	7.99

Lab/Cor, Inc.
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Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S5 A1	Volume (L)	5268.5
Client Sample No.	NRA-R101-101004	No. of Grid Openings	17
Description	Indirect Analysis of L/C# 041210-34	Filter Area (mm²)	193
Analysis Date	4/19/2005	Area Analyzed (mm²)	0.246
Analyst	KM	Analytical Sens. (struc/cc)	0.000297
		Detection Limit. (struc/cc)	0.000889

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	0.0	<0.000889	0.00 - 0.000889	0
Total Asbestos Structures	0.0	<0.000889	0.00 - 0.000889	0
Asbestos Structures > 5um	0.0	<0.000889	0.00 - 0.000889	0
Asbestos Fibers and Bundles > 5um	0.0	<0.000889	0.00 - 0.000889	0
PCM Equivalent Fibers-US	0.0	<0.000889	0.00 - 0.000889	0
PCM Equivalent Structures-US	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL ASB STRUCS >10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000889	0.00 - 0.000889	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000889	0.00 - 0.000889	0
AHERA-like Total Structures 3:1	0.0	<0.000889	0.00 - 0.000889	0
AHERA-like Asb Strucs >5 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
AHERA-like Asb Strucs 5 - 10 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
Total Other Amphibole Strucs 3:1	0.0	<0.000889	0.00 - 0.000889	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000889	0.00 - 0.000889	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000889	0.00 - 0.000889	0

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A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: NRA-R101-101004

Lab/Cor Sample No.: B5418 S5 A1

Description: Indirect Analysis of L/C# 041210-34

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	B33				NSD							
A	2	B13				NSD							
A	3	C3				NSD							
A	4	C30				NSD							
A	5	C10				NSD							
A	6	A32				NSD							
A	7	A12				NSD							
A	8	A1				NSD							
A	9	D11				NSD							
A	10	D31				NSD							
B	11	B41				NSD							
B	12	B21				NSD							
B	13	B1				NSD							
B	14	C11				NSD							
B	15	C31				NSD							
B	16	D40				NSD							
B	17	D10				NSD							

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S6 A1	Volume (L)	5186.256	D Shymal 5/5/05
Client Sample No.	NRA-R01-101004	No. of Grid Openings	17	
Description	Indirect Analysis of L/C# 041210-35	Filter Area (mm ²)	193	
Analysis Date	4/18/2005	Area Analyzed (mm ²)	0.246	
Analyst	DW	Analytical Sens. (struc/cc)	0.000302	
		Detection Limit. (struc/cc)	0.000903	

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	24.4	0.00181	0.000665 - 0.00395	6
Total Asbestos Structures	24.4	0.00181	0.000665 - 0.00395	6
Asbestos Structures > 5um	4.1	0.000302	0.00 - 0.00143	1
Asbestos Fibers and Bundles > 5um	4.1	0.000302	0.00 - 0.00143	1
PCM Equivalent Fibers-US	4.1	0.000302	0.00 - 0.00143	1
PCM Equivalent Structures-US	4.1	0.000302	0.00 - 0.00143	1
PROTOCOL ASB STRUCS 5-10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL ASB STRUCS >10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000903	0.00 - 0.000903	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000903	0.00 - 0.000903	0
AHERA-like Total Structures 3:1	24.4	0.00181	0.000665 - 0.00395	6
AHERA-like Asb Strucs >5 and 3:1	4.1	0.000302	0.00 - 0.00143	1
AHERA-like Asb Strucs 5 - 10 and 3:1	4.1	0.000302	0.00 - 0.00143	1
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000903	0.00 - 0.000903	0
Total Other Amphibole Strucs 3:1	0.0	<0.000903	0.00 - 0.000903	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000903	0.00 - 0.000903	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000903	0.00 - 0.000903	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000903	0.00 - 0.000903	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: NRA-R01-101004

Lab/Cor Sample No.: B5418 S6 A1

Descripton: Indirect Analysis of L/C# 041210-35

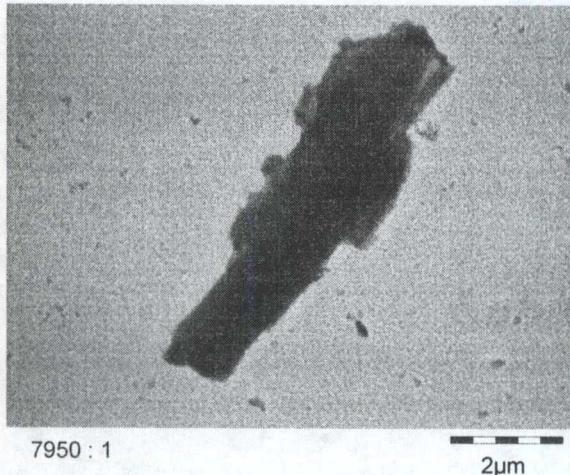
Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	B40				NSD							
'A	2	B20				NSD							
A	3	B10				NSD							
A	4	C10	CD	1	1	B	3.5	0.3	12			Mg, Si Chrysotile	TAS_AHRA
A	5	C30				NSD							
A	6	D41				NSD							
A	7	D31				NSD							
A	8	D1	CD	2	2	F	0.75	0.1	7.5			Chrysotile	TAS_AHRA
A	9	A1	AZQ	3	3	F	6	1.5	4.0	329	16046	Mg, Si, Ca, Fe Actinolite Zone Axis [2 0 1] DW	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	10	A10				NSD							
B	11	D1				NSD							
B	12	D21				NSD							
B	13	D41				NSD							
B	14	C31				NSD							
B	15	C1				NSD							
B	16	A22	AQ	4	4	F	4	0.75	5.3			Mg, Si, Ca, Fe Actinolite	TAS_AHRA
B	16	A22	CD	5	5	F	0.6	0.1	6.0			Chrysotile	TAS_AHRA
B	17	A2	AQ	6	6	F	2	0.6	3.3			Mg, Si, Ca, Fe Actinolite	TAS_AHRA

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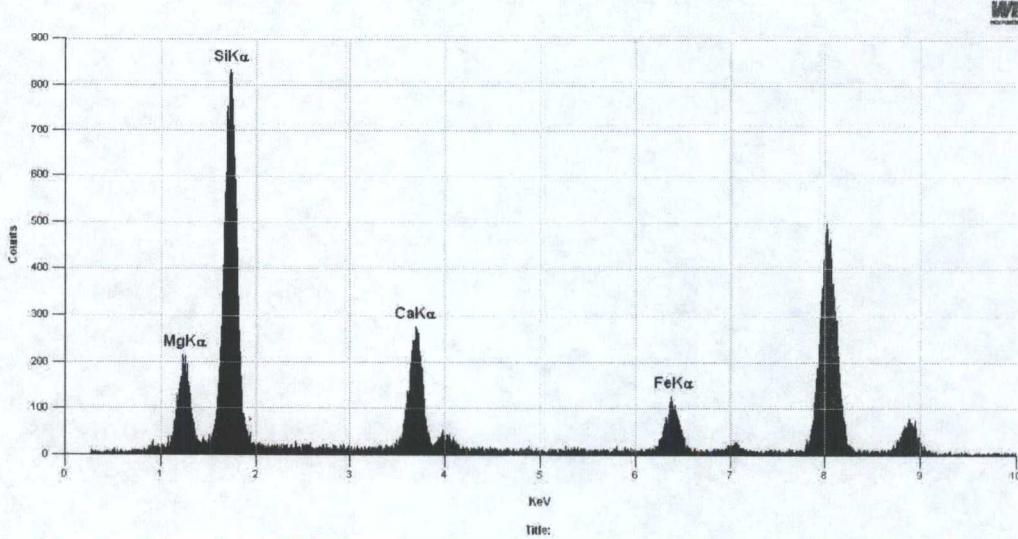
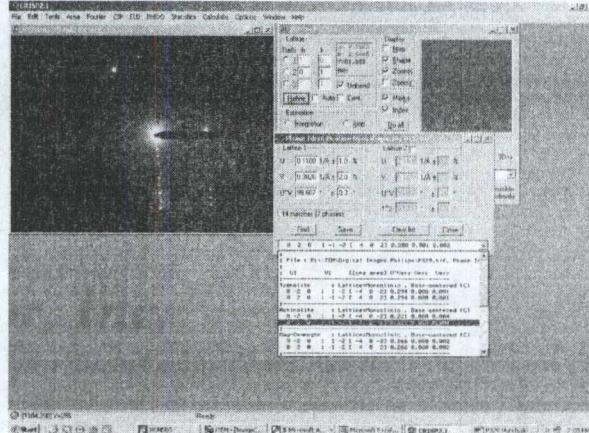
ACTINOLITE

Neg# [329]; [Job#050680-06]
[4/18/05] iITEM Image
Zone Axis [2 0 1]



7950 : 1

2μm



WINEDS
Version 2.0.0.0

Quantitative Analysis Results - Standardless Analysis :
050680-01 EDS#16046 Mon, Apr 18 2005
EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 30.30

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	9.02	MgO	16.85	1.16	16.85
Si	21.97	SiO ₂	61.17	1.94	61.17
Ca	4.95	CaO	12.87	0.72	12.87
Fe	2.46	Fe ₂ O ₃	9.10	0.86	9.10
<Total>	100.00		100.00		100.00

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	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	61.17	Si+4	8.0000	8.0000							
Al ₂ O ₃	0	Al+3	0.0000	0.0000	0.0000						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	9.1	Fe+3	0.0404			0.0404	0.0000				
MgO	16.85	Mg+2	3.5443			3.5443	0.0000				
MnO	0	Fe+2	1.0950			1.0950	0.0000				
CaO	12.87	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	0	Ca+2	1.9663					1.9663	0.0000		
K ₂ O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000						0.0000	0.0000	
Total	99.99		Excess	T site	0.0000	C site	0.0000	B site	0	A site	0

Total	8	4.6798	1.9663	0.0000	0.0000
%Fill	100	93.5955	98.3154		

Prefix none

Name actinolite

Modifier none

Group Calcic Amphibole

Sample # 050680-06

<u>Values</u>	<u>Satisfied Conditions</u>
(Ca,Na)@B	1.97 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.97 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.76 (Mg/(Mg+Fe2))< 0.9
Si	8.00

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S7 A1	Volume (L)	4791.6
Client Sample No.	NRA-R05-101004	No. of Grid Openings	19
Description	Indirect Analysis of L/C# 041210-36	Filter Area (mm²)	193
Analysis Date	4/18/2005	Area Analyzed (mm²)	0.275
Analyst	DW	Analytical Sens. (struc/cc)	0.000293
		Detection Limit. (struc/cc)	0.000875

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	7.3	0.000585	0.00 - 0.00184	2
Total Asbestos Structures	7.3	0.000585	0.00 - 0.00184	2
Asbestos Structures > 5um	7.3	0.000585	0.00 - 0.00184	2
Asbestos Fibers and Bundles > 5um	7.3	0.000585	0.00 - 0.00184	2
PCM Equivalent Fibers-US	7.3	0.000585	0.00 - 0.00184	2
PCM Equivalent Structures-US	7.3	0.000585	0.00 - 0.00184	2
PROTOCOL ASB STRUCS 5-10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL ASB STRUCS >10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000875	0.00 - 0.000875	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000875	0.00 - 0.000875	0
AHERA-like Total Structures 3:1	7.3	0.000585	0.00 - 0.00184	2
AHERA-like Asb Strucs >5 and 3:1	7.3	0.000585	0.00 - 0.00184	2
AHERA-like Asb Strucs 5 - 10 and 3:1	3.6	0.000293	0.00 - 0.00139	1
AHERA-like Asb Strucs >10 and 3:1	3.6	0.000293	0.00 - 0.00139	1
Total Other Amphibole Strucs 3:1	0.0	<0.000875	0.00 - 0.000875	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000875	0.00 - 0.000875	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000875	0.00 - 0.000875	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000875	0.00 - 0.000875	0

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Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: NRA-R05-101004

Lab/Cor Sample No.: B5418 S7 A1

Description: Indirect Analysis of L/C# 041210-36

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wld	Asp	Neg#	EDS#	Comment	Count Categories
A	1	B41				NSD							
A	2	B21				NSD							
A	3	B1				NSD							
A	4	C11				NSD							
A	5	C31				NSD							
A	6	C43				NSD							
A	7	C23	AZQ	1	1	F	5.2	1.2	4.3	330	16047	Mg, Si, Ca, Fe Actinolite Zone Axis [5-1 0] DW	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
A	8	C3				NSD							
A	9	B13				NSD							
A	10	B33				NSD							
B	11	A41				NSD							
B	12	A31				NSD							
B	13	A21	AQ	2	2	F	15	2.5	6.0			Mg, Si, Ca, Fe Actinolite	AS>5, AFB>5, PCMEF-US, PCMES-US, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
B	14	A11				NSD							
B	15	A1				NSD							
B	16	D11				NSD							
B	17	D31				NSD							
B	18	D40				NSD							
B	19	C20				NSD							

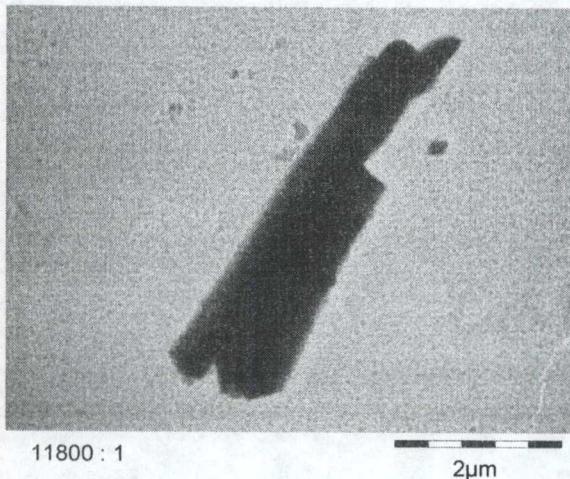
Lab/Cor, Inc.
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ACTINOLITE

Neg# [330]; [Job#050680-07]

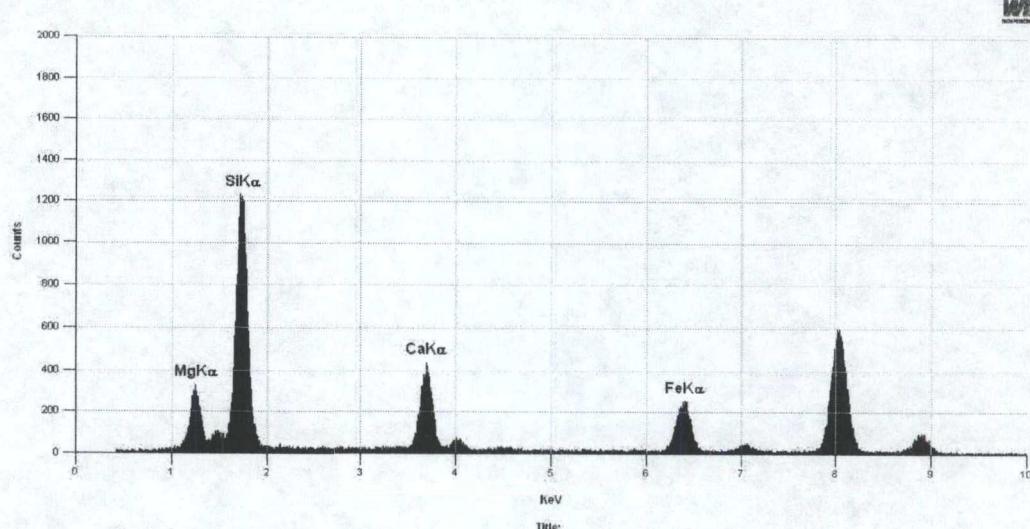
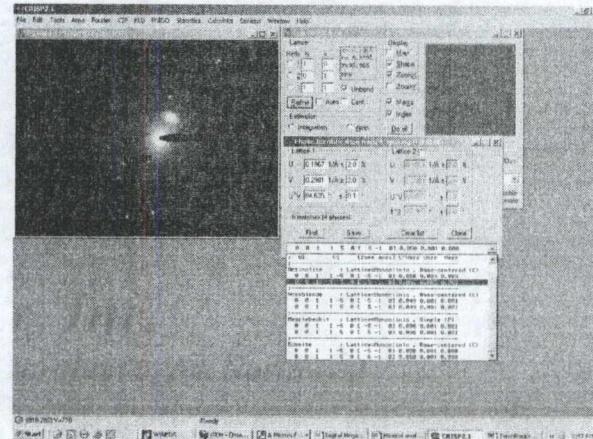
[4/18/05] iITEM Image

Zone Axis [5 -1 0]



11800 : 1

2μm



WINEDS

Quantitative Analysis Results - Standardless Analysis :
050680-07 EDS#16047 EDS Spectrum Mon, Apr 18 2005
EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 12.21

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	9.35	MgO	17.27	0.98	17.27
Si	21.12	SiO ₂	58.16	1.71	58.16
Ca	4.78	CaO	12.28	0.65	12.28
Fe	3.36	Fe ₂ O ₃	12.29	0.97	12.29
<Total>	100.00		100.00		100.00

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	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	58.16	Si+4	8.0000	8.0000							
Al ₂ O ₃	0	Al+3	0.0000	0.0000	0.0000						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.29	Fe+3	0.2227			0.2227	0.0000				
MgO	17.27	Mg+2	3.5847			3.5847	0.0000				
MnO	0	Fe+2	1.1921			1.1921	0.0000				
CaO	12.28	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	0	Ca+2	1.8358					1.8358	0.0000		
K ₂ O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000						0.0000	0.0000	
Total	100		Excess	T site	0.0000	C site	0.0000	B site	0	A site	0

		Total	8	4.9994	1.8358	0.0000	0.0000
		%Fill	100	99.9885	91.7891		

Prefix none

Name actinolite

Modifier none

Group Calcic Amphibole

Sample # 050680-07

<u>Values</u>	<u>Satisfied Conditions</u>
(Ca,Na)@B	1.84 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.84 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.75 (Mg/(Mg+Fe2))< 0.9
Si	8.00

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S8 A1	Volume (L)	4919.34
Client Sample No.	NRA-R04-101004	No. of Grid Openings	18
Description	Indirect Analysis of L/C# 041210-37	Filter Area (mm²)	193
Analysis Date	4/18/2005	Area Analyzed (mm²)	0.261
Analyst	DW	Analytical Sens. (struc/cc)	0.000301
		Detection Limit. (struc/cc)	0.000900

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	0.0	<0.000900	0.00 - 0.000900	0
Total Asbestos Structures	0.0	<0.000900	0.00 - 0.000900	0
Asbestos Structures > 5um	0.0	<0.000900	0.00 - 0.000900	0
Asbestos Fibers and Bundles > 5um	0.0	<0.000900	0.00 - 0.000900	0
PCM Equivalent Fibers-US	0.0	<0.000900	0.00 - 0.000900	0
PCM Equivalent Structures-US	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL ASB STRUCS >10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000900	0.00 - 0.000900	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000900	0.00 - 0.000900	0
AHERA-like Total Structures 3:1	0.0	<0.000900	0.00 - 0.000900	0
AHERA-like Asb Strucs >5 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
AHERA-like Asb Strucs 5 - 10 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
Total Other Amphibole Strucs 3:1	0.0	<0.000900	0.00 - 0.000900	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000900	0.00 - 0.000900	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000900	0.00 - 0.000900	0

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: NRA-R04-101004

Lab/Cor Sample No.: B5418 S8 A1

Description: Indirect Analysis of L/C# 041210-37

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	B24				NSD							
A	2	B4				NSD							
A	3	C14				NSD							
A	4	C24				NSD							
A	5	C34				NSD							
A	6	C44				NSD							
A	7	C42				NSD							
A	8	C22				NSD							
A	9	C1				NSD							
A	10	B11				NSD							
A	11	B31				NSD							
B	12	A41				NSD							
B	13	A31				NSD							
B	14	A21				NSD							
B	15	A11				NSD							
B	16	A1				NSD							
B	17	D11				NSD							
B	18	D21				NSD							

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S9 A1	Volume (L)	5024.93
Client Sample No.	NRA-R03-101004	No. of Grid Openings	18
Description	Indirect Analysis of L/C# 041210-38	Filter Area (mm²)	193
Analysis Date	4/18/2005	Area Analyzed (mm²)	0.261
Analyst	DW	Analytical Sens. (struc/cc)	0.000295
		Detection Limit. (struc/cc)	0.000881

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	23.0	0.00177	0.000649 - 0.00385	6
Total Asbestos Structures	23.0	0.00177	0.000649 - 0.00385	6
Asbestos Structures > 5um	7.7	0.000589	0.00 - 0.00186	2
Asbestos Fibers and Bundles > 5um	0.0	<0.000881	0.00 - 0.000881	0
PCM Equivalent Fibers-US	0.0	<0.000881	0.00 - 0.000881	0
PCM Equivalent Structures-US	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL ASB STRUCS >10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000881	0.00 - 0.000881	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000881	0.00 - 0.000881	0
AHERA-like Total Structures 3:1	23.0	0.00177	0.000649 - 0.00385	6
AHERA-like Asb Strucs >5 and 3:1	7.7	0.000589	0.00 - 0.00186	2
AHERA-like Asb Strucs 5 - 10 and 3:1	3.8	0.000295	0.00 - 0.00140	1
AHERA-like Asb Strucs >10 and 3:1	3.8	0.000295	0.00 - 0.00140	1
Total Other Amphibole Strucs 3:1	0.0	<0.000881	0.00 - 0.000881	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000881	0.00 - 0.000881	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000881	0.00 - 0.000881	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000881	0.00 - 0.000881	0

Lab/Cor, Inc.
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Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: NRA-R03-101004

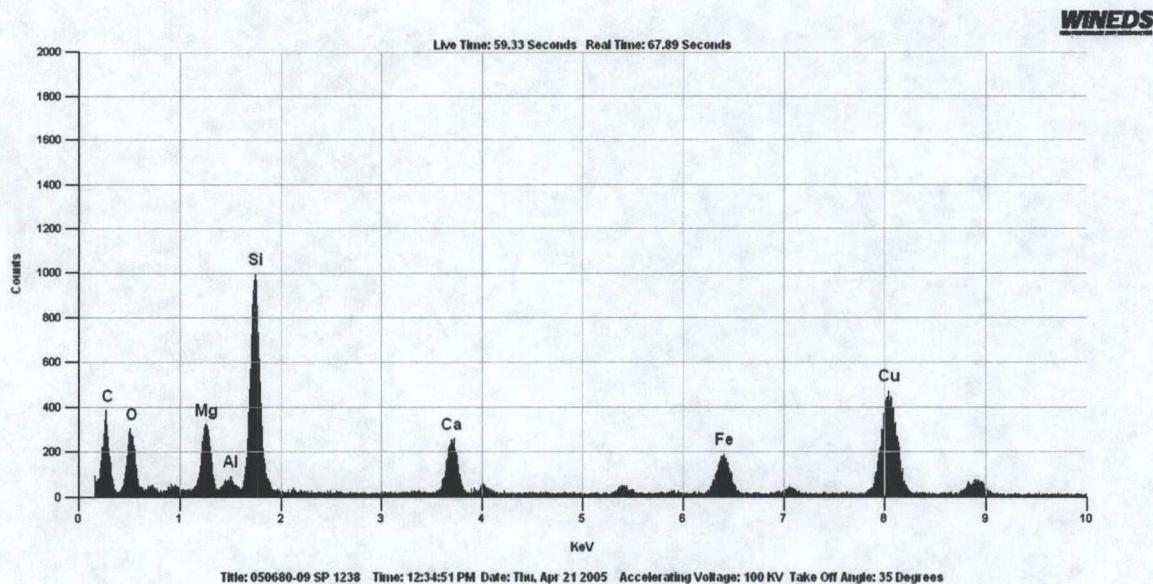
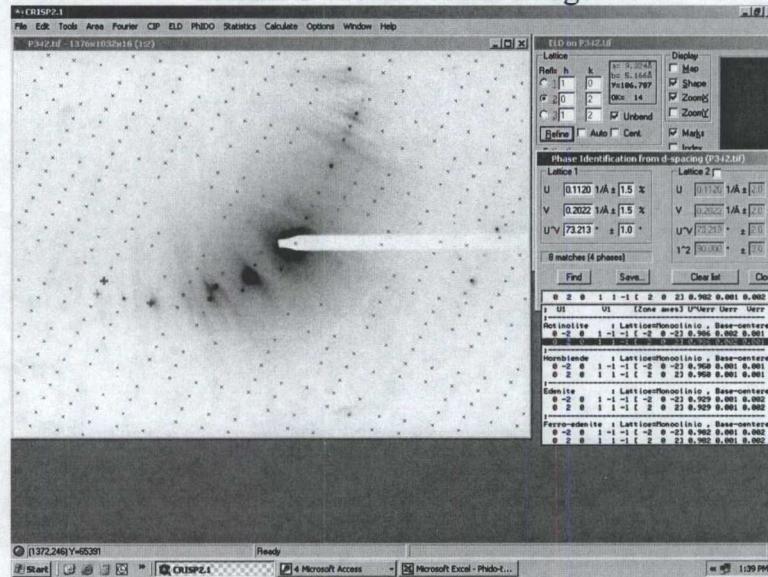
Lab/Cor Sample No.: B5418 S9 A1

Descripton: Indirect Analysis of L/C# 041210-38

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	B43				NSD							
A	2	B13	AQ	1	1	F	1.8	0.5	3.6			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
A	3	C13				NSD							
A	4	B41				NSD							
A	5	B21				NSD							
A	6	B1	AQ	2	2	B	27	8	3.4			Mg, Al, Si, Ca, Fe Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
A	7	C11				NSD							
A	8	C31				NSD							
B	9	B41				NSD							
B	10	B21				NSD							
B	11	B1	AQ	3	3	F	2.2	0.5	4.4	342	1238	Mg, Al, Si, Ca, Fe Actinolite Zone Axis [1 0 1] - KM	TAS_AHRA
B	11	B1	AQ	4		MD1-0	3	0.8	3.8			Actinolite	TAS_AHRA
B	11	B1	AQ		4	MF	3	0.5	6.0			Mg, Al, Si, Ca, Fe Actinolite	
B	12	C21				NSD							
B	13	A1	AQ	5	5	F	3	0.6	5.0			Mg, Al, Si, Ca, Fe Actinolite	TAS_AHRA
B	14	D31	AQ	6		MD1-0	6	5	1.2			Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS>10_AHRA
B	14	D31	AQ		6	MF	4	0.6	6.7			Mg, Al, Si, Ca, Fe Actinolite	
B	15	A33				NSD							
B	16	A13				NSD							
B	17	D3				NSD							
B	18	D10				NSD							

Lab/Cor, Inc.
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ACTINOLITE - Zone Axis [1 0 1]
 Neg# P342 Job# 050680-09
 PHILIPS 420EX- iTEM Image



Quantitative Analysis Results - Standardless Analysis :
050680-09 SP 1238 Thu, Apr 21 2005
 EDS Parameters - 100KV, Takeoff Angle: 35.0°, Fit Index: 123.14
 Correction: CLIFF LORIMER, Cycles: 1

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	7.78	MgO	14.33	0.60	14.33
Al	0.48	Al ₂ O ₃	1.13	0.24	1.13
Si	21.54	SiO ₂	59.16	1.44	59.16
Ca	4.98	CaO	12.78	0.72	12.78
Fe	3.45	Fe ₂ O ₃	12.61	1.09	12.61
<Total>		100.00	100.00		100.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	59.16	Si+4	8.0000	8.0000							
Al ₂ O ₃	1.13	Al+3	0.2080	0.0000	0.2080						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	12.61	Fe+3	0.0281			0.0281	0.0000				
MgO	14.33	Mg+2	3.0202			3.0202	0.0000				
MnO	0	Fe+2	1.4801			1.4801	0.0000				
CaO	12.78	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	0	Ca+2	1.9402				1.9402	0.0000			
K ₂ O	0	Na+	0.0000				0.0000	0.0000	0.0000	0.0000	
		K+	0.0000						0.0000	0.0000	
Total	100.01		Excess	T site	0.2080	C site	0.0000	B site	0	A site	0

Prefix	none	Total	8	4.7364	1.9402	0.0000	0.0000
Name	actinolite	%Fill	100	94.7286	97.0111		

Modifier	none
Group	Calcic Amphibole

Sample # 050680-09-1238

Values	Satisfied Conditions
(Ca,Na)@B	1.94 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.94 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.67 (Mg/(Mg+Fe2))< 0.9
Si	8.00

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Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

ANALYSIS DETAIL

Lab/Cor Sample No.	B5418 S10 A1	Volume (L)	5049
Client Sample No.	NRA-R02-101004	No. of Grid Openings	18
Description	Indirect Analysis of L/C# 041210-39	Filter Area (mm²)	193
Analysis Date	4/18/2005	Area Analyzed (mm²)	0.261
Analyst	DW	Analytical Sens. (struc/cc)	0.000293
		Detection Limit. (struc/cc)	0.000876

Structure Type	Filter Density (s/mm ²)	Concen-tration (struc/cc)	95% Confidence Interval (struc/cc)	Struc. Count
Primary Asbestos Structures	15.3	0.00117	0.000319 - 0.00300	4
Total Asbestos Structures	15.3	0.00117	0.000319 - 0.00300	4
Asbestos Structures > 5um	7.7	0.000586	0.00 - 0.00185	2
Asbestos Fibers and Bundles > 5um	0.0	<0.000876	0.00 - 0.000876	0
PCM Equivalent Fibers-US	0.0	<0.000876	0.00 - 0.000876	0
PCM Equivalent Structures-US	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL ASB STRUCS 5-10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL ASB STRUCS >10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL ASB STRUCS TOTAL	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL CHRYS STRUCS 5-10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL CHRYS STRUCS >10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL CHRYS STRUCS TOTAL	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL AMPH STRUCS 5-10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL AMPH STRUCS >10	0.0	<0.000876	0.00 - 0.000876	0
PROTOCOL AMPH STRUCS TOTAL	0.0	<0.000876	0.00 - 0.000876	0
AHERA-like Total Structures 3:1	15.3	0.00117	0.000319 - 0.00300	4
AHERA-like Asb Strucs >5 and 3:1	7.7	0.000586	0.00 - 0.00185	2
AHERA-like Asb Strucs 5 - 10 and 3:1	7.7	0.000586	0.00 - 0.00185	2
AHERA-like Asb Strucs >10 and 3:1	0.0	<0.000876	0.00 - 0.000876	0
Total Other Amphibole Strucs 3:1	0.0	<0.000876	0.00 - 0.000876	0
Other Amphibole Strucs >5 and 3:1	0.0	<0.000876	0.00 - 0.000876	0
Other Amphibole Strucs 5 - 10 and 3:1	0.0	<0.000876	0.00 - 0.000876	0
Other Amphibole Strucs >10 and 3:1	0.0	<0.000876	0.00 - 0.000876	0

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A Professional Service Corporation in the Northwest

Report # 050680R01

Client: Ecology and Environment, Inc.

Project Name: Indirect QC of L/C# 041210

TEM ASBESTOS STRUCTURE COUNT - RAW DATA

Sample No.: NRA-R02-101004

Lab/Cor Sample No.: B5418 S10 A1

Descripton: Indirect Analysis of L/C# 041210-39

Gr	No.	Loc.	ID	Prim	Tot	Class	Len	Wid	Asp	Neg#	EDS#	Comment	Count Categories
A	1	A41				NSD							
A	2	A31				NSD							
A	3	A21				NSD							
A	4	A11				NSD							
A	5	A1				NSD							
A	6	D11	AZQ	1		MD1-0	10	10	1.0			Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
A	6	D11	AZQ		1	MF	3	0.4	7.5	331	16048	Mg, Si, Ca, Fe Actinolite Zone Axis [5 1 4] DW	
A	7	D21	CDQ	2	2	F	0.5	0.1	5.0	332	16049	Mg, Si Chrysotile Confirmed DW	TAS_AHRA
A	8	D31				NSD							
A	9	D41	AQ	3	3	F	2	0.25	8.0			Mg, Si, Ca, Fe Actinolite	TAS_AHRA
A	10	C30				NSD							
B	11	B42				NSD							
B	12	B32				NSD							
B	13	B22				NSD							
B	14	B12				NSD							
B	15	B2				NSD							
B	16	C12				NSD							
B	17	C32				NSD							
B	18	C33	AQ	4		MD1-0	6	6	1.0			Actinolite	AS>5, TAS_AHRA, AS>5_AHRA, AS5-10_AHRA
B	18	C33	AQ		4	MF	2.5	0.5	5.0			Mg, Si, Ca, Fe Actinolite	

NSD = No Structures Detected

PAS = Primary Asbestos Structures

TAS = Total Asbestos Structures

AS>5 = Asbestos Structures > 5um

AFB>5 = Asbestos Fibers and Bundles > 5um

PCMEF-US = PCM Equivalent Fibers-US

PCMES-US = PCM Equivalent Structures-US

PCMEF-ISO = PCM Equivalent Fibers-ISO

PCMES-ISO = PCM Equivalent Structures-ISO

PSAS 5-10 = PROTOCOL ASB STRUCS 5-10

PSAS >10 = PROTOCOL ASB STRUCS >10

PSAS TOT = PROTOCOL ASB STRUCS TOTAL

PSCH 5-10 = PROTOCOL CHRYS STRUCS 5-10

PSCH >10 = PROTOCOL CHRYS STRUCS >10

PSCH TOT = PROTOCOL CHRYS STRUCS TOTAL

PSAM 5-10 = PROTOCOL AMPH STRUCS 5-10

PSAM >10 = PROTOCOL AMPH STRUCS >10

PSAM TOT = PROTOCOL AMPH STRUCS TOTAL

TAS_AHRA = AHERA-like Total Strucs 3:1

AS>5_AHRA = AHERA-like Asb Strucs >5 and 3:1

AS5-10_AHRA = AHERA-like Asb Strucs 5 - 10 and 3:1

AS>10_AHRA = AHERA-like Asb Strucs >10 and 3:1

TOS_AHRA = Total Other Amphibole Strucs 3:1

OS>5_AHRA = Other Amphibole Struc >5 and 3:1

OS5-10_AHRA = Other Amphibole Struc 5 - 10 and 3:1

OS>10_AHRA = Other Amphibole Strucs >10 and 3:1

CF = Cleavage Fragments

TS = Transitional Structures

PChS = Primary Chrysotile Structures

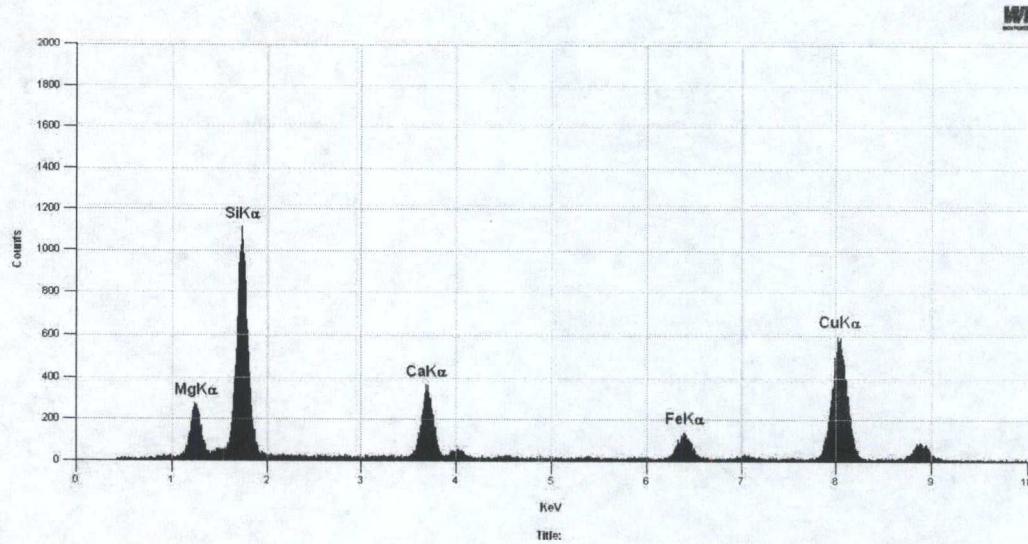
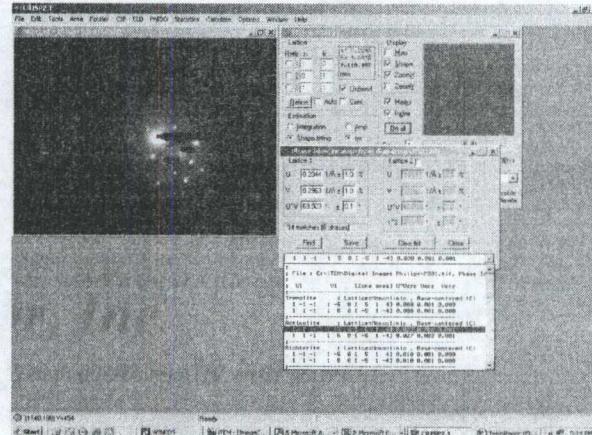
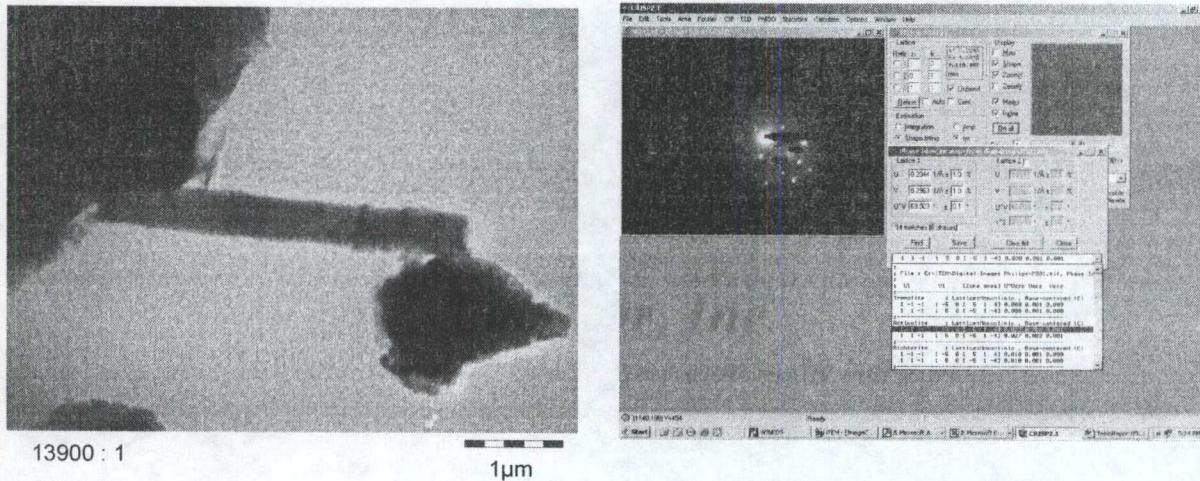
PAmS = Primary Amphibole Structures

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ACTINOLITE

Neg# [331]; [Job#050680-10]
[4/18/05] iITEM Image
Zone Axis [5 1 4]



Quantitative Analysis Results - Standardless Analysis :
050680-10 EDS#16048 EDS Spectrum Mon, Apr 18 2005
EDS Parameters - 100KV, Takeoff Angle: 38.0°, Fit Index: 8.32

Element	Atoms%	Compound	Weight%	Error(±)	Norm%
Mg	9.78	MgO	18.44	1.11	18.44
Si	22.11	SiO ₂	62.14	1.91	62.14
Ca	4.61	CaO	12.09	0.72	12.09
Fe	1.96	Fe ₂ O ₃	7.33	0.86	7.33
<Total>	100.00		100.00		100.00

	Wt Percent		ions	T site	Leftover	C site	Leftover	B site	Leftover	A site	Leftover
SiO ₂	62.14	Si+4	8.0000	8.0000							
Al ₂ O ₃	0	Al+3	0.0000	0.0000	0.0000						
TiO ₂	0	Ti+4	0.0000	0.0000	0.0000						
Cr ₂ O ₃	0	Cr+3	0.0000			0.0000	0.0000				
Fe(total)O	7.33	Fe+3	0.0417			0.0417	0.0000				
MgO	18.44	Mg+2	3.8360			3.8360	0.0000				
MnO	0	Fe+2	0.8929			0.8929	0.0000				
CaO	12.09	Mn+2	0.0000			0.0000	0.0000				
Na ₂ O	0	Ca+2	1.8410					1.8410	0.0000		
K ₂ O	0	Na+	0.0000					0.0000	0.0000	0.0000	0.0000
		K+	0.0000						0.0000	0.0000	
Total	100	Excess	T site	0.0000	C site	0.0000	B site	0	A site		0

Total	8	4.7706	1.8410	0.0000	0.0000
%Fill	100	95.4124	92.0478		

Prefix none

Name actinolite

Modifier none

Group Calcic Amphibole

Sample # 050680-10

<u>Values</u>	<u>Satisfied Conditions</u>
(Ca,Na)@B	1.84 (Ca,Na)@B >= 1 and Na@B < 0.5
Na@B	0.00 Ca@B >= 1.5 and (Na,K)@A < 0.5
Ca@B	1.84 (Mg/(Mg+Fe2))>= 0.5
(Na,K)@A	0.00 Si > 7.5
Mg/(Mg+Fe2)	0.81 (Mg/(Mg+Fe2))< 0.9
Si	8.00

JobNumb	Samp	GridI	GridO	AnalyteID	Negative	EDSNum	Comment
050680	1A	6	actin xx		1600	1231	Zone Axis [5 1 4] - KM
050680	1B	8	winch xx		1601	1232	Zone Axis [1 0 1] - KM
050680	1A	4	chrys xx		1599	1230	Verified - KM
050680	2A	3	chrys xx		1602	1233	Verified- KM
050680	2A	7	actin xx			1234	
050680	2B	12	actin xx		337	16053	Zone Axis [2 0 1] DW
050680	3A	8	chrys xx		334	16051	Verified - KM
050680	3A	4	actin xx			1236	
050680	3A	7	actin xx		333	16050	Zone Axis [1 0 0] DW
050680	4A	7	actin xx			16069	
050680	4B	8	actin xx		355	16070	Zone Axis [3 1 3] - KM
050680	4A	1	chrys xx		354	16068	Verified - KM
050680	6A	9	actin xx		329	16046	Zone Axis [2 0 1] DW
050680	7A	7	actin xx		330	16047	Zone Axis [5 -1 0] DW
050680	9B	11	actin xx		342	1238	Zone Axis [1 0 1] - KM
050680	10A	7	chrys xx		332	16049	Confirmed DW
050680	10A	6	actin xx		331	16048	Zone Axis [5 1 4] DW

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050680 El Dorado

INDIRECT PREP LIST

Reprep of samples: 041210

Prepped	Client ID #	L/C Job #	L/C Original Job #	Sample Vol. (L)	FF Remain	FF Used	Visual Loading	Number of Grid Openings	Aliquot (ml)	Dilution
MH 4/11/2005	SRA-R04-100704	050680-01	041210-18	6136.4	0.89	0.5	1.1	15 ✓	20	1:1
MH 4/11/2005	SRA-R03-100704	050680-02	041210-19	5885.4	0.89	0.5	1.1	16 ✓	20	1:1
MH 4/11/2005	SRA-R05-100704	050680-03	041210-20	5817.4	0.89	0.5	1.1	16 ✓	20	1:1
MH 4/11/2005	SRA-R02-100704	050680-04	041210-21	6603.3	0.89	0.5	1.1	14 ✓	20	1:1
MH 4/11/2005	NRA-R101-101004	050680-05	041210-34	5268.5	0.89	0.5	1.1	17 ✓	20	1:1
MH 4/11/2005	NRA-R01-101004	050680-06	041210-35	5186.26	0.89	0.5	1.1	17 ✓	20	1:1
MH 4/11/2005	NRA-R05-101004	050680-07	041210-36	4791.6	0.89	0.5	1.1	19 ✓	20	1:1
MH 4/11/2005	NRA-R04-101004	050680-08	041210-37	4919.34	0.89	0.5	1.1	18 ✓	20	1:1
MH 4/11/2005	NRA-R03-101004	050680-09	041210-38	5024.93	0.89	0.5	1.1	18 ✓	20	1:1
MH 4/11/2005	NRA-R02-101004	050680-10	041210-39	5049	0.89	0.5	1.1	18 ✓	20	1:1

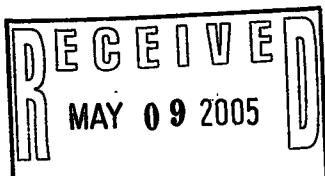
QC Supervisor,

Kate March

QC Technician,

Minh Huynh

Lab/Cor, Inc.
A Professional Service Corporation in the Northwest



050680 El Dorado

INDIRECT PREP LIST

Reprep of samples: 041210

Prepped	Client ID #	L/C Job #	L/C Original Job #	Sample Vol. (L)	FF Remain	FF Used	Visual Loading	Number of Grid Openings	Aliquot (ml)	Dilution
MH 4/11/2005	SRA-R04-100704	050680-01	041210-18	6136.4	0.89	0.5	1.1	15	20	1:1
MH 4/11/2005	SRA-R03-100704	050680-02	041210-19	5885.4	0.89	0.5	1.1	16	20	1:1
MH 4/11/2005	SRA-R05-100704	050680-03	041210-20	5817.4	0.89	0.5	1.1	16	20	1:1
MH 4/11/2005	SRA-R02-100704	050680-04	041210-21	6603.3	0.89	0.5	1.1	14	20	1:1
MH 4/11/2005	NRA-R101-101004	050680-05	041210-34	5268.5	0.89	0.5	1.1	17	20	1:1
MH 4/11/2005	NRA-R01-101004	050680-06	041210-35	5186.26	0.89	0.5	1.1	17	20	1:1
MH 4/11/2005	NRA-R05-101004	050680-07	041210-36	4791.6	0.89	0.5	1.1	19	20	1:1
MH 4/11/2005	NRA-R04-101004	050680-08	041210-37	4919.34	0.89	0.5	1.1	18	20	1:1
MH 4/11/2005	NRA-R03-101004	050680-09	041210-38	5024.93	0.89	0.5	1.1	18	20	1:1
MH 4/11/2005	NRA-R02-101004	050680-10	041210-39	5049	0.89	0.5	1.1	18	20	1:1

QC Supervisor,

Kate March

QC Technician,

Minh Huynh